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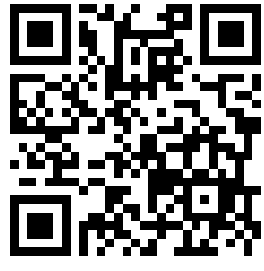

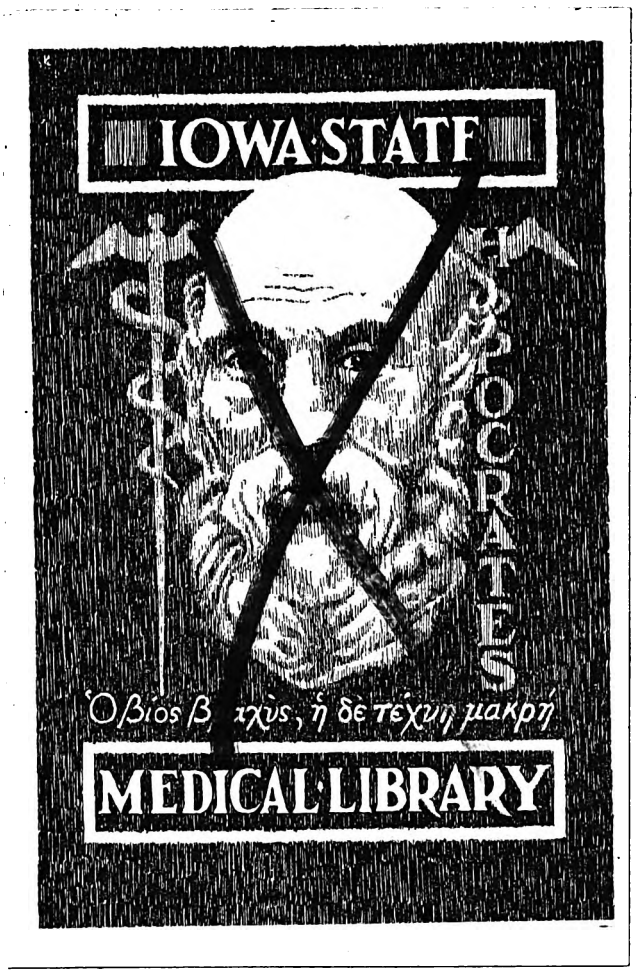

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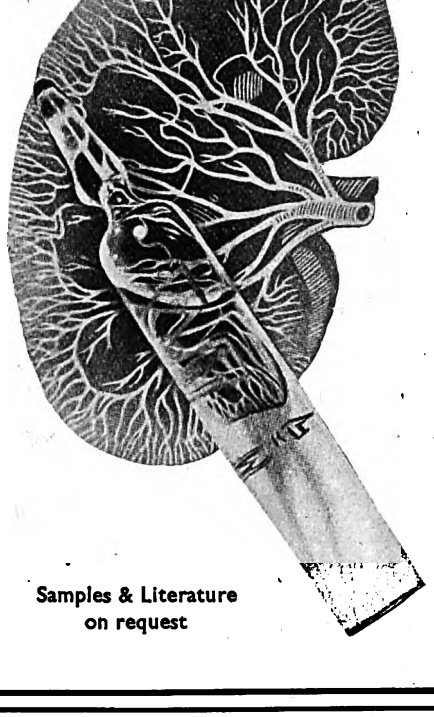

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ADDRESSES AND ORIGINAL ARTICLES

THE HYGIENE OF A QUIET MIND *

BY LORD HORDER, G.C.V.O., F.R.C.P.

I HAD better begin by defining my subject. I am dealing primarily with the Common or Public Health. The idea that the state of the mind is a factor in the Common Health may seem novel but I hope to justify it.

I have already committed myself to the view that the Common Health cannot be considered properly apart from the Common Happiness. If this is true the mind enters into this question quite as much as the body does. And if it be true, as we generally suppose it is,—appearances, at times, to the contrary—that it is in the realm of the mind, rather than that of the body, that mankind progresses, then, whatever we do to improve the body we dare not neglect the mind.

We are well accustomed to the notion of hygiene in regard to the body. We accept, and applaud, quite properly, the many advances made during the past few decades in the sphere of preventive medicine, and we are proud of the fact that this country had led the van in this regard. Even in utilising the science of nutrition for the service of the citizen, and the citizen's family, we are showing signs of keeping the lead in public hygiene, though there is still much to be done in this direction.

But there is a hygiene of the mind as well as of the body. There is a state of mental fitness as there is a state of physical fitness. I am not thinking of, and I shall not to-day be concerned with, persons afflicted by mental disease, any more than, when we talk of physical fitness, we have in mind primarily persons who are suffering from bodily disease. I am thinking of what we conveniently speak of as the man in the street, the average member of the community. It is his, and her, mind that I have in view, just as it is his, and her, body.

Physical fitness is much sought after, especially in times of national stress. Whether for offence or defence physical fitness is a basic part of a nation's preparedness and therefore enters conspicuously into a stateman's or a leader's appeal. The present call to physical fitness, accompanied in some countries by a highly organised and heavily subsidised scheme of training, with the element of compulsion added, is a state of things that strongly suggests a thinly veiled preparation for war, or for the preservation of peace,—for as between these two intentions the thoughts of some folk have become rather confused. Nor, I fear, is the confusion entirely discouraged.

In our slower, unregimented, way we British are following suit.

SCOPE OF MENTAL HYGIENE

This "drive" for physical fitness has no equivalent on the mental side, unless we can consider rewriting history, both past and current, or mechanising religious beliefs, in terms of ultra-nationalism, as an effort in this direction. But I do not remember any public utterance that bade the citizen "Seek ye first the Kingdom of God and all these things" (that is, muscles, heart, lungs and brain) "shall be added unto you."

An organised attempt at improving mental hygiene, if we consider the whole range of mental development in the public interest, admittedly, would seem to be a task for a superman. Yet if we contract our field of vision, and consider first things first, then there surely are some basic helps towards mental hygiene which, though they lack the note of direct psychological appeal, are still within the range of practical achievement. They are things which have to do with that borderland where mind and body meet, where they work together, play together, grow up and become mature together, the mind in training for the roll of dominant partner all the time. What are these things? A sense of security in respect of food and shelter and work, and (we must add just now) national and empire self-preservation; an adequate amount of sound sleep; some leisure; and what we all agree these days to call the amenities of life. These are days of Planning. The more planning the better. And the wider the outlook of the planner the better still for the people on whose behalf the planning is done.

There *are* things to do about these fundamentals. They *are* important, because if they are safeguarded for us the life and growth of the mind are enormously assisted.

Life and growth are out of our hands anyway, whether it be of the body or of the mind. The gardener, however expert, cannot *make* the plant live and grow; he can but see that it is supplied with the means of these,—air and sun and water and proper soil. He can do some training in addition, but life and growth are out of his hands. The psychologist can explain us to ourselves, in a terminology which changes from time to time, but he cannot give life and growth to our minds.

Can the State do more for the hygiene of our minds than ensure its basic needs? I am not at all sure that it cannot. In addition to keeping the channels of our senses unobstructed and resolving the mind's more primitive conflicts, could it not perhaps go a step further and provide us with authentic facts, tell us things that do actually happen in the world, so that we are informed about events? Or are we so debased that a mere record of happenings would find but few readers whilst the propagandist newspapers continue to boast of their competitive millions? Even if a State news sheet of this kind had but few readers these few would be so important that the experiment seems worth making. The "press" would still be "free" and comment would still be unrestricted. There are so few countries left that *are* free that, with all the evils attaching to a free press, we must be very careful not to reduce the number of free countries any further.

It is doubtful if more than this can be done by the State in the cause of mental hygiene, and it is doubtful if more is necessary. The rest is with us. Unlike our bodies, our minds cannot be classified in terms of A1 to C3 because there is no standard of mental fitness. For when I use the word "mind" I am not, of course, referring to mere intelligence, though this is a very important mental attribute. Our "intelligence quotient" does admit of rough measurement, but little else in our mental equipment, if anything, does. With no standard to aim at, therefore, a thorough scheme of mental hygiene is not practicable.

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* Extracts from the Trueman Wood lecture delivered on March 23rd before the Royal Society of Arts. The lecture will appear in full in the *Journal of the Royal Society of Arts*, to which we are indebted for permission to reproduce these passages.

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There are other great differences between the mind and the body. Development on the physical side, though it may go far, is relatively limited, but in the case of the mind potential development is vastly greater. Then again, individual deviations from the average on the side of the body fall within very narrow limits; on the side of the mind the deviations sometimes assume relatively enormous proportions. In the matter of physique, a dwarf is scarcely more than half as small, and a giant is certainly less than half as tall, as the average man. But in the matter of mental stature, even if such a state of things has its rough counterpart when we consider the lesser developed minds amongst us, what measurement shall we accord to the mind of Euclid or Plato or Leonardo or Newton or Shakespeare?

Although we cannot explain why it is that great minds like these suddenly arise, like rockets from the dusky earth, we can understand a little how it is possible for them to do so. The dawn of mind dates from the beginning of organic life so that man's mind has a history that goes back many millions of years.

BODY AND MIND

There are two or three other pertinent facts that must be introduced in this approach to the main part of my theme.

The seat of man's mind is his brain. His mind is concentrated in the brain to a much higher degree than is the mind of any other living organism. Man's brain is by far the most important part of his body. It is served by all the other parts and it controls all the other parts. The mind and the brain are indissoluble partners until death do them part. Although it is a striking fact that a great mind may sometimes be housed in a poorly developed, or diseased, body, and a fine physique may house a small mind, the old adage remains true for the vast majority of us: *mens sana in corpore sano.*

We know a great deal more to-day about the manner in which this partnership acts than we ever did before. Especially has biochemistry thrown much light upon the interaction of mind and body. It is possible to trace all sorts of behaviour, both good and bad, to the action of hormones. But when our behaviour is social we are prone to attribute it to our virtuous minds, and when it is antisocial, when we do not, or cannot, control ourselves, we are prone to unload upon "our glands," mistaking the mere mechanism of faulty conduct for its cause.

There have been those who have strongly objected to this partnership, and have even sought to dissolve it. Porphyry, the biographer of Plotinus, tells us that this great Neo-Platonist, who taught that the material world had no real existence, "seemed ashamed to be in a body." The sentiment has not even yet died out. Some people are always apologising for their bodies, when these are the only satisfactory things about them. Nor has the hope died out that we can, by systematic torture and subjection, purge the body of ills that, in fact, belong more truly to the mind. Though the modern ascetic does not go so far as Buddha. We have the picture of him sitting "with his tongue pressed against his palate, resolutely checking, repressing, chastening his aspirations, waiting the moment when the supernatural illumination should come upon him. He struggles for a still more perfect performance by imposing the greatest strain upon his physical frame: he holds his breath: he denies himself nourishment. His body becomes attenuated by self-inflicted pain . . . and he finds himself no nearer to the goal."

Science can explain why these efforts at dissolving the partnership must be doomed to failure. The whole range of biological Science as now revealed to us must be recruited in order, not to divorce body and mind, but to "integrate the personality so that the various parts function harmoniously together as one unit." And, as I shall indicate later, this can be done by the great majority of us. Not by "saving ourselves" too much—I still omit the mental invalids—but by letting our minds function through a fairly large arc of experience. Aiming all the time at the development of what I shall call the Quiet Mind, but not at a state of Quietism. Encouraging Fancy, or mental play, so that this is never too far away from the more sober side of mental training. Fancy, "that bodies forth the forms of things unknown." Coming at last to view life as a Comedy in the sense that Balzac and Meredith used that word.

The mind of any individual is the resultant of many factors: race, tradition, heredity, physique, environment, education, discipline. Though it is true that the calibre of the mind may be severely limited by some of these factors, and especially by heredity, it is equally true that the mind is capable of enormous development during the individual's own life time. Such development may take place in various directions, leading to the production of minds of different types and different capacities.

I am not now concerned with a consideration of the heights to which man's mind may rise in special directions. I propose rather to sketch the outline of a particular aspect of mind, the *Quiet Mind*, which may be regarded as the highest product of mental hygiene. This quality of mind is one which is within the range of the great majority of mankind who start with a modicum of capacity, and yet which is capable of very great influence both upon its own life and upon the lives of others. It is a quality in the mind which balances intelligence with energy and gentleness with fortitude. Its foundation is integrity. On this foundation a diligent search for, and a strict adherence to, Truth build the house. The coping stone is control.

The final product of mental hygiene, this Quiet Mind, is not to be regarded as an end in itself but rather as a means to right conduct. Not only conduct in relation to the individual life, but to family life, to community life, to national life and to the whole brotherhood of man.

I shall try to describe some of the characteristics and expressions of the Quiet Mind and to discuss its corrective possibilities in contemporary life. And yet it is not quite true to say that I shall attempt a description, so much as try to do what is called in another place "feature" the Quiet Mind. In other words, having shown you the raw materials, and having displayed the parts, my own mental integrity demands that I should assemble the whole machine and demonstrate its horse-power.

EXAMPLES OF THE QUIET MIND

This quality of the Quiet Mind, how is it manifest? Looking around us, where can we see it? Does it exist at all in real life or is it merely a synthetic dream? It is not. We all meet folk who possess it and they differ markedly from those who don't. Granted, some of those people who have it seem to have had it from the start. Their father, or their mother, possessed it. They have not so far to go as

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the rest of us in the effort to get it. There are others who have had to fight for it, because their temperaments were from the first a handicap, yet they have "seen past the agony," they have "beheld God in Heaven and have striven." In the course of history there have passed down to us the stories of many whose minds have shown this quality. When you have heard my brief selection you will perhaps say "It was *character* these men and women had." Well, I admit that the Quiet Mind, as I portray it, bulks very largely in the attribute to which we give this name. Confucius seems to have been of this nature. He considers that men's minds fall into two groups, the higher group of mind which was calm and serene; and the lower group which was constantly agitated and worried. A statesman asked for a hint on the art of governing. The Master replied: "Set the example of diligent toil." Asked for a further hint, he said "Be patient and untiring."

The prophet Isaiah must have radiated this particular quality if we may judge from his recorded utterances. Witness his advice to Ahaz, who seemed very badly to need it: "Take heed and be quiet; fear not." As a corrective to an arrogant nation he tells them that "their strength is to sit still." And to his own people: "In quietness and confidence shall be your strength." He regards "quietness and assurance" as the best end-results of a righteous life. The prophet Daniel clearly showed this quality: the lions recognised it; animals do. Paul of Tarsus must have had a bitter struggle to attain what degree of the Quiet Mind he eventually achieved. But he gave the Thessalonians a piece of advice which at least shows us what he thought of its value. "Study to be quiet and to do your own business," he said, and there could be no better text to govern mental hygiene.

I can do no more than give you glimpses of some who seem to me to have had this quality of the Quiet Mind. There was Socrates, drinking his draught of hemlock. And Galileo, though he had a slight lapse, as happens to the best of us. And Luther, with his "So help me God, I can do no other." And, in a very different connexion, Francis Drake in that thrilling scene on Plymouth Hoe. And Abraham Lincoln and the younger Pitt, both so certain of their power to save their country. There were those Quakers, whom the Indians found sitting quietly at their prayer-meeting, so undisturbed and undismayed that their fierce victors, fascinated, sat down beside them. And there was this quality about Livingstone in South Africa, and Gordon at Khartoum, and Elizabeth Fry in Newgate gaol. In quite another sphere Pasteur possessed it, doggedly pursuing his researches against all opposition, to be followed by the Curies, labouring on whilst the rain dripped through the ramshackle roof of their workroom (pathetically called their laboratory) on to their crucibles below. And there have been many others who achieved this coveted end and, by virtue of it, were leaders of men. They were able to drop "still dews of quietness" as they made their way amongst their fellows. They brought with them a coolness and a balm, and their fellows blessed them because of their tranquility and themselves became quieter and stronger. For the weak recognise the strong and lean upon them. When the strong arrive panic departs.

When we deplore the lack of a national leader what is it that we really want unless it be this Quiet Mind?

We cannot grant it to Carlyle; his was a temperament upon which the graft never really "took." And the poignancy of this fact seems to show itself through the lines of his apotheosis of Silence and Secrecy. Of these he says:—

"Altars might still be raised to them. Silence is the element in which great things fashion themselves together, that at length they may emerge, full formed and majestic, into the daylight of Life which they are henceforth to rule. Silence and the great silent men scattered here and there, each in his department; silently thinking, silently working; whom no morning newspaper makes mention of, they are the salt of the earth."

But of these examples I have quoted it may be said: "these were great, as well as quiet, minds." Can we also achieve it? And the answer is "Yes." But how? Well, not by doing "some great thing." "Why were the saints saints?" someone asked. And the answer came: "Because they were cheerful when it was difficult to be cheerful, and patient when it was difficult to be patient. They pushed on when they wanted to stand still, and kept silent when they wanted to talk." That was all. So simple, but so difficult. A matter of mental hygiene.

THE UNQUIET MIND AND ITS DISCIPLINE

So many of us unload on to our bodies, seeing in them deterrents from mental hygiene. "Make my body well," says one, "and I will tidy up my mind." And the answer so often is: "Tidy up your mind and your body *will* be well." "But what *is* the matter with me?" asks another, and the cryptic reply comes: "your face . . . break up that set and furrowed brow before it is too late," and a quotation from William James, who held that we don't smile because we're happy, we are happy because we smile. (That indissoluble partnership I spoke of just now). It is so long since some people have smiled that happiness and they have become strangers. Of them it cannot be said: "Then are they glad because they shall be quiet."

These are some of the signs by which we judge the *absence* of the Quiet Mind. There are others. "You don't think me nervy, do you, doctor?" fiddling with the inkpot and showing the bitten nails; or walking up and down the room instead of sitting in the obvious chair; or lying on the couch supporting the head in mid air by the hand, though we have placed the cushion in position quite comfortably three times; or being unable to tell their story until they are allowed to smoke a cigarette? Not nervy, indeed!

This anxiety state must be resolved; that is the mental equivalent of breaking up the set and furrowed face. It may need some expert help, though not as often as is nowadays supposed. The psychotherapist himself, both amateur and professional, now and again needs to be extricated by common sense from the web of his own doctrinaire difficulties. You remember the story of Grimaldi, the clown? "Go and see Grimaldi" said the doctor to the anxious, nervy patient after hearing the recital of his woes. "But I *am* Grimaldi!" said the patient.

Well, there are things we can do, and some of them might even be called "first aid"—remedies that any fool can apply. Relaxing, and all that. *Why* are your muscles so tense? *Why* do you fidget so? *Why* are you so restless? *Why* do you walk up and down and repeat yourself so often? *Why* do you escape from yourself by so much talk, and then complain that you are always tired?

At this and at every moment in Time there are

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things to do, physically and mentally. Now is what matters. Don't spend it over that residue of old troubles which has either never been properly buried or which is still frequently exhumed for morbid examination. "But how can you expect me to be fit, ?" says one of you, "when I had that severe illness fifteen years ago?" Or "that operation which took so long to do, and left the surgeon so tired?" It may be necessary in the case of the psychoneurote that he and his doctor should delve into the unconscious for that hidden memory which still holds his mind in chains. With most of us the converse applies: freedom comes through a blessed forgetfulness.

Then there is that important matter of routine in the mental life. Just as there is such a thing as occupational fitness on the physical side, which makes "jerks" unnecessary, so there is occupational fitness on the mental side. Every man's mind should be so engaged at 9 o'clock in the morning that, if it were not, he would either miss his next meal or let someone else down very badly, or (preferably) both.

There are many old maxims which are applicable to this business of self-discipline, and none of them should be despised because it is old. It is easier to get a hearing for things that are new than to get conviction for things that have been said already. All the same, I do not want this address to drift into a homily. Suffice it to say that the attainment of control has no new technique and, indeed, no royal road. There is one last thing to say about it, however, and that is this: just as in physical training, so here, the finer technique which comes later comes both more easily and more smoothly and the results are much more interesting.

AN UNQUIET WORLD

It must be allowed that the conditions for embarking upon mental hygiene are by no means so helpful as they were when the stoics undertook the task.

There seems no doubt whatever that a certain aloofness, a withdrawing of the mind at times from the busy-ness of life is a requisite to mental hygiene. The philosophers have always insisted upon this, and the Christian Church has enjoined and practised quiet meditation in solitude for centuries. The most modern of all religious groups makes the "quiet hour" a *sine qua non*. The apostle Mark, in his matter-of-fact way, explains that the reason Jesus bade the disciples to "come into a desert place" was because "there were many coming and going, and they had no leisure." The trouble is that even a fragment of "life which is private, hidden, solitary, closed to public view, becomes more difficult every day. The situation has certain characteristics which are obvious to the senses. Noise in the street, for instance—the street has become stentorian. One of the privileges which man used to take for granted was silence. Now his right to a certain amount of silence is recognised no more. The street penetrates into our own private corners and fills them with public clamour. He who wishes to meditate must get used to doing it submerged in the midst of a public racket, a diver in an ocean of collective noise. Man is never left alone by himself. Whether he likes it or not, he must be with others. The public square and the avenue force their anonymous clamour in through the very walls of his home."

(You will think these last few sentences are mine, because they voice a sentiment sympathetic to one of my own activities. But they are not mine; they are taken from a book by the Spanish writer, y Gasset.) As I said the other day, quoting a friend, the *inescapability* of noise has become one of its worst terrors.

The herd instinct seems to have taken charge for the time being. Men "devote themselves passionately to whatever there is left in them of the sheep. They want to march through life together, along the collective path, shoulder to shoulder, wool rubbing wool, and the head down. This is the reason why so many European peoples are looking for a shepherd and a sheep dog."

We must recover our ability to be sometimes alone; it is imperative. Only our "seclusion must not be mechanical, but spiritual, that is, must be elevation. At times the whole world seems to be in a conspiracy to importune you with emphatic trifles. Friend, client, child, sickness, fear, want, charity, all knock at once at the closet door, and say,—'Come out unto us.' But keep thy state; come not into their confusion."

ESCAPISTS AND DICTATORS

Some people side-track the pursuit of the Quiet Mind, as I have described it, either from laziness, or selfishness, or from mistaken zeal.

There are many ways of attempting an escape from the rigours attaching to mental hygiene, and there are many ways of escaping the responsibilities of using our minds in the service of others. Many of the methods may seem to justify themselves to the escapist. Escape may be made by the individual or by a group, by the single citizen or by a nation. Drink may be an escape for the individual, as dope may be. Hard and uninterrupted work, or play, all day long or, indeed, needless sleep. Illness of the factitious sort, with or without operations. On a higher plane it may be so ardent a pursuit of the religious life that no time is left to live it, or a mistaken view of charity—"saving her soul on us."

An individual, or a group, may excuse himself, or themselves, from participation in what may, and not without reason, be called a dog-fight in which others are engaged. But in most, though not in all, dog-fights there is an under-dog, and this is a point that is so often conveniently overlooked. "But who is my neighbour?" . . . "A certain man . . . fell among thieves." A nation may preserve an isolationist attitude on the ground that a landslide in international probity elsewhere is sufficiently remote to excuse participation except by the ineffective expression of non-approval. But if a stand for integrity in international dealings is only made when it is clearly seen that the vested interest of that nation is directly and immediately concerned, the momentum gained by another nation that finds no opposition to methods of "violence and illegitimacy" may have become irresistible.

If one should ask "how is it that other social forces allow a triumph of juridical chaos?" the answer is "for the simple reason that no important social forces show an enthusiasm for the law as a live issue." "If there is no single institution which warms all hearts the victory goes to one which despises all existing forms and institutions and occupies itself with other things."

Any force is strong whose enemy is weak. That is what makes dictators strong. They are negative forces; they batten on the weakness of others. "For this reason they are essentially transitory—

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which does not necessarily mean that their stay will be short."

* * *

All this time you may be saying: "A quiet mind! A quiet mind with the world in its present state? Have you seen the morning paper? Have you seen the *evening* paper? You evidently didn't sit up to hear the latest news—(copyright reserved)?" To which I reply, "It is *because* of the state of the world, and it is (especially) *because* of the morning and evening paper, that this Quiet Mind is so essential. It may just save the world,—in spite of the morning and evening papers . . ." Morning and evening "we lay waste our powers . . ."

There are other problems than the international problem; there is the problem of a man's own confused mentality, and there are confused domesticities, too. And children, how imitative they are, and how reliant upon strength and serenity in their seniors. What a disservice we shall be doing to the future if our children, who will form it, reflect the unquiet of our own minds. We dare not escape this individual responsibility of mental discipline and of the attainment of the Quiet Mind.

I spoke just now of isolationist countries. Does such a topical reference need excuse? Surely not. None of us can remain *spiritually* isolationist; none of us in this country has, thank God; but our maintenance of the Quiet Mind is unfortunately conditioned, especially just now, by things as they are in the world.

All the more vital is it that we should hold on to the spiritual values, and harbour them, not in "the old unquiet breast" but in a mind that strives all the more for "plainness and clearness without shadow of stain," because these values have gone temporarily awry elsewhere.

JUVENILE RHEUMATISM: THE THERAPEUTIC ASPECT*

By WILFRID SHELDON, M.D., F.R.C.P. Lond.

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THE word rheumatism is so widely used by medical as well as lay people, and has come to cover such a variety of symptoms in adults as well as children, that some preliminary definition of the term juvenile rheumatism is necessary. This term, as I understand it, embraces three clinical conditions: acute rheumatic arthritis (in this country called rheumatic fever); rheumatic disease of the heart, with which must be included such occasional complications as rheumatic pneumonia, subcutaneous nodules, and the rheumatic skin rash, erythema marginatum; and rheumatic chorea. For some years now a fourth group of symptoms has been spoken of as subacute rheumatism and has even been supposed to indicate a pre-rheumatic state, implying that children with these symptoms are particularly prone to acquire one of the three forms of rheumatic manifestation given above. The main symptoms in this fourth group consist of vague aches and pains in the muscles of the limbs and in the neighbourhood of joints, often combined with such common evidence of debility as anæmia, irritability, and fatigue. Analysis of the after-history of large numbers of children in this group has convinced me that these pains are no more than the accompaniments of a condition of debility that may come about for a great variety of reasons but do not in actual fact render the children particularly liable to suffer from one of the three more serious forms of rheumatism. In his recent summary of ten years' experience in the Supervisory Rheumatic Clinic at Cardiff, Anderson (1936) comes to a similar conclusion, stating that pains in the limbs are by themselves not to be taken as evidence of rheumatism. At the present time large numbers of children in this fourth group are under observation in our various rheumatism supervisory clinics, where if the label of rheumatism is firmly attached to them, they are likely enough to develop an unwarranted sense of invalidism. The time has come when we should cease to apply to these symptoms of debility the same term that we use for heart disease and chorea.

Facilities for Treatment

The treatment of the acute phase of the disease is carried out either in the child's own home or in hospital. But rheumatism, especially as it affects the heart, is a disease from which recovery is slowly made, and the management of the long convalescent period may be said to rival in importance the care of the acute phase. Largely owing to the inspiration of that great pioneer of rheumatism in childhood, Dr. F. J. Poynton, facilities in this country for the organised control of the period of convalescence of children recovering from an attack of rheumatic carditis have developed rapidly during the last decade. Special country homes have been set up where these children may spend many months under skilled supervision, going through a graded convalescence until eventually they become fit to resume life in their own homes. The value of these homes is immense, and moreover, the observation of rheumatic children over many months and under ideal conditions has led to advances in our knowledge of the disease, as witness the writings of Dr. Bernard Schlesinger, based on his experience at the West Wickham Heart Home.

In general, the work at these homes is conducted on the following lines: the children are admitted either from their own homes or from a general hospital, and are kept at rest in bed until the inflammation in the heart is judged by clinical standards to have settled down. Help in deciding this question is given by the daily charting of the pulse-rate, and by regular weighings, for a steady increase in weight is valuable evidence that the rheumatic process is quiescent. In some homes there are facilities for the regular estimation of the sedimentation-rate of the red cells. In the absence of other infections that may elevate the sedimentation-rate, this test is a delicate index of the state of the rheumatic process, and the child should not be allowed up until the rate of sedimentation has dropped to a normal level (less than 10 mm. in the first hour). In passing, it may be mentioned that active chorea uncomplicated by other rheumatic manifestations leaves the sedimentation-rate normal, one of the many small points in which chorea differs from the other manifestations. From the first grade of rest in bed the child passes through five or six grades of increasing activity, beginning with sitting up out of bed for a short time each day, and finally reaching a top grade in which the child is up all day except for a middle day period of rest, and is able to take part in simple games and exercises. The progress from a lower to a higher grade is governed by the

* Based on the opening remarks at a discussion at the International Congress on Rheumatism and Hydrology at Oxford on March 30th.

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clinical condition together with the additional aids I have just mentioned, and it may cover a period of six months or more. Education at these homes is a valuable asset, so that although the child is away for months from ordinary schooling, it is not neglected. Before he returns home such important questions of home management as whether he is able to walk up stairs, to take part in games and exercises, to attend an ordinary elementary school or a special school for physically defective children, have been answered. In many of our cities the child on returning home continues to attend a rheumatism supervisory clinic where the progress of the rheumatic state is observed. Eventually when the child reaches school-leaving age, the question of employment suited to the capacity of the heart is considered at these clinics. In this way there is now a scheme of organised supervision for many of our rheumatic children, which lasts from the inception of their illness throughout childhood.

Treatment

Although many different lines of therapy have been attempted, no outstanding or recent advances have been made in the treatment of children during an attack of acute articular or cardiac rheumatism. Rest in bed remains our sheet anchor. In the severest cases rest must be absolute, and the child must not be allowed to do anything for himself; it is at this stage that the value of expert nursing is so great. While recumbency is desirable, the position in bed must be such as to give the child maximum comfort, and when in addition to active carditis there is some degree of mechanical failure from previous attacks of rheumatism, the child is often more comfortable propped up on pillows. There are those who hold that every case of rheumatic arthritis is accompanied by some degree of carditis, even though it may not reach a degree sufficient for clinical recognition; for cases of this sort a month in bed should be the minimum period; when the heart is clearly affected the rest must be longer, and I have already indicated how we may determine when the time has come to begin getting the child up.

As to dietetic treatment, there is no good evidence that any particular food is harmful and therefore the diet should be as sustaining as possible, attractively served, and suited to the child's digestive capacity. The vitamin intake must be safeguarded, and so long as the child is not nauseated, vitamins A and D in the form of cod-liver oil have seemed beneficial. Recently Abbasy, Hill, and Harris (1936) have shown that children with acute rheumatism excrete a subnormal amount of vitamin C, but this is not peculiar to rheumatism, and Schultz (1936) has demonstrated that specific treatment with ascorbic acid, given orally and intravenously, does not influence the course of the disease.

DRUGS

Salicylates.—Since the introduction of salicylate some 60 years ago no drug has maintained such popularity in the treatment of acute rheumatism. The effect of salicylates has recently been reviewed by Murray-Lyon (1936). Provided that the dose is adequate, there is no doubt that the natural course of the disease is considerably curtailed, as judged by the subsidence of the articular inflammation and the return of the temperature to normal. The ideal dose is one that will give these results in the shortest time without producing toxic symptoms. To a child 10–15 grains of sodium salicylate may be given every 3 or 4 hours with the expectation that the symptoms will subside in two or three days, but it is necessary to continue the drug in smaller doses for a further two or three weeks, otherwise within a day or two of stopping it the temperature may rise again and joint pains recur. When salicylate is being pushed in these doses, it is a wise precaution to prescribe double the amount of alkali (sodium bicarbonate), otherwise toxic symptoms such as vomiting, giddiness, and rapid breathing, all of which are evidence of salicylate acidosis, may develop. Whether salicylate exerts any beneficial action on rheumatic carditis is still a matter of opinion; the fleeting joint pains that often accompany active carditis are as a rule quickly relieved by salicylate, and sometimes precordial pain as well, but there is no good evidence that recovery from the inflammatory process in the heart is hastened. Experience shows that in the most severe cardiac cases the temperature often tends to be normal or subnormal, and to produce this effect artificially by salicylate may leave the child weak and with less recuperative power. The use of salicylate in uncomplicated chorea is disappointing. One may sum up by saying that salicylate combined with alkali should be pushed in acute articular rheumatism, and may be used in smaller doses for the relief of pain in carditis, although in this condition a curative effect is not to be expected.

Aspirin has to some extent replaced sodium salicylate, but its effect is no greater, and it has the disadvantage of being incompatible with alkalis. Once the urgent symptoms of acute rheumatic arthritis have been subdued, a dose of 5 grains of aspirin three or four times a day offers a useful means of maintaining the salicylate effect, but if it is employed in the larger doses required to overcome acute arthritis, toxic symptoms may easily arise. A rapid hissing respiration is the most noticeable of these. Occasionally the alleviation of rheumatic fever expected from salicylate fails to materialise, and then Tolysin (Neocinchophen) may be used instead. It is prescribed in the same dose as salicylate and is admittedly less toxic. It has seemed particularly useful in children who have an already badly damaged heart and are undergoing a relapse of carditis accompanied by precordial or joint pains.

Pyramidon, although used extensively abroad in the treatment of acute rheumatism, has not gained popularity in this country, except perhaps in the treatment of chorea in which its quieting effect is often valuable. It is particularly beneficial when the movements are so violent as to render the child sleepless and exhausted. The association of pyramidon with agranulocytosis is likely to make doctors still more chary of using it, although in actual fact this unfortunate association is met with in adults rather than in children.

Nirvanol (phenyl-ethyl-hydantoin) is another drug which has found more favour abroad than in this country. Its use is mainly confined to the treatment of chorea, for there is little evidence that it exerts a beneficial effect on other rheumatic manifestations. Poynton and Schlesinger (1931) have reported the disappearance of subcutaneous nodules under nirvanol therapy, although of course it is known that these nodules may disappear spontaneously within a day or two, and they further point out that the use of this drug in severe carditis may precipitate a relapse, such as pericarditis. Even its use in chorea is open to the objection that to be effective it has to be given in poisonous doses sufficient to evoke a "nirvanol reaction" consisting of fever, a rash, and eosinophilia. Mental confusion may persist

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for some weeks afterwards, and fatalities have been recorded. One may well hesitate to employ a drug with these capabilities in the treatment of a disease which under rest and symptomatic treatment spontaneously recovers.

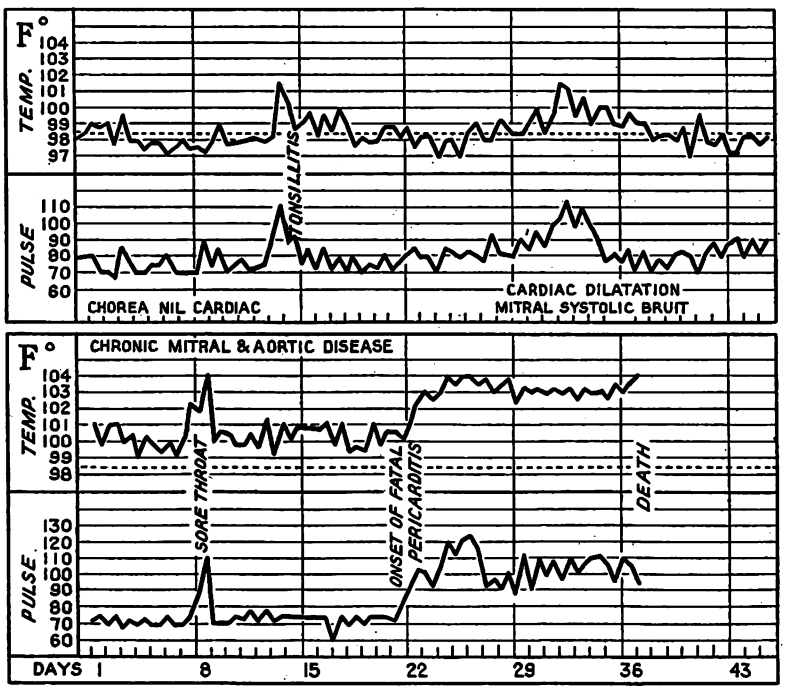
Sulphanilamide.—The good results obtained from this drug in the treatment of hæmolytic streptococcal and other infections has led to its use in acute rheumatism. My own experience of it in this connexion has been disappointing, for it does not appear to influence the course of acute carditis, although in two cases of rheumatic pneumonia in which the temperature had been swinging daily over several degrees, the fever subsided after giving the drug for 48 hours. The value of sulphanilamide to a rheumatic child who has a sore-throat, given with the object of preventing a relapse of rheumatism, requires investigation.

VACCINE AND SERUM THERAPY

Various attempts have been made to treat acute rheumatism by means of sera and vaccines, but the results to date have been inconclusive, the beneficial effects claimed by some workers being balanced by the adverse experience of others and by the warnings given from time to time that these methods are not without danger. These difficulties are likely to continue until the causative agent of acute rheumatism has been firmly established.

In recent years evidence has accumulated to show that infections with hæmolytic streptococci most commonly forerun an attack of rheumatism, but even if they are a causative agent, the mechanism by which they produce a rheumatic reaction is not clearly understood. Swift and others (1931) have pointed out an analogy between some of the symptoms of serum sickness and acute rheumatism, and from the standpoint that the rheumatic phenomena may be an example of hypersensitivity to the lytic products of streptococci, have used a streptococcal vaccine as a method of desensitisation. The vaccine consisted of hæmolytic streptococci, and was administered intravenously in increasing doses. Their claims for the treatment were guarded. In 1932 Collis and I employed intravenous vaccination with hæmolytic streptococci in a group of 47 rheumatic children at the Cheyne Hospital and at Great Ormond-street. The initial dose was 200,000 organisms per c.cm. and this was increased over a series of 16 injections to a dose of 100 million organisms. It was found that a relapse of rheumatism could occur while the treatment was in progress, and if the treatment was given to cases of active heart disease an increase in the rheumatic condition might appear within a few days. Perhaps the fact that the treatment was abandoned after a few months' trial may be allowed to speak for itself.

Antistreptococcal serum has also been used by various workers in acute rheumatism, but with conflicting results. For instance, Eason and Carpenter (1937) have recently employed antiscarlatina serum in acute rheumatism, polyarthritis, and chorea, and regard it as an effective therapeutic measure particularly in cases that have proved resistant to salicylate, and they hold that it is safe to give serum even in the presence of grave carditis. They took the precaution of testing for sensitivity before giving the serum. On the other hand, Hitchcock, McEwen, and Swift (1930), using antihæmolytic streptococcal serum, went so far as to say that "were salicylate as ineffectual as serum in this condition, its use would long since have been abandoned." Others have also noted that while many rheumatic children can receive a foreign serum without accident, now and again severe and fatal relapses of rheumatism may be provoked. Clearly we are not in a position at present to advise the wide use of foreign serum.



Temperature charts of two rheumatic children showing a relapse of acute rheumatism, mild in one case, fatal in the other, occurring in the third week after a sore-throat.

It is perhaps surprising that no extensive trial of human convalescent serum has as yet been reported, especially as recent investigations have suggested that a virus infection may be the ultimate cause. One difficulty is that acute rheumatism is very likely to relapse, and it is not known whether patients who struggle through to recovery attain thereby a state of even temporary immunity. Archer (1936) comments favourably on this method of treatment in 4 cases, but unfortunately furnishes no details of the rheumatic state of the donors.

Prevention

The prevention of a disease that causes so much suffering, disability, and death as does rheumatic carditis must be the concern of us all, but once again we are hindered by the lack of knowledge of the causative agent. It is well known that juvenile rheumatism falls particularly upon the children of the artisan class, and it may be expected that the various health measures designed to overcome adverse living conditions, such as overcrowding, badly ventilated

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and damp dwellings, and inadequate dietary, will help to lessen the incidence of this disease.

As to prevention for the individual, there must surely be an opportunity in the interval of 1–4 weeks that elapses between an acute infection such as a sore-throat and subsequent rheumatism. This interval is illustrated by the temperature charts (see Figure). There is some evidence to suggest that 20–30 grains of aspirin daily throughout this period may prevent or at any rate mitigate the subsequent rheumatic attack, but although it may be wise to do this for a child who, being already rheumatic, has a sore-throat, it is not practical to extend it to all children after an acute throat infection.

As soon as the existence of the interval just described is appreciated, it follows that a sore-throat must act as a warning of the possible development of rheumatism within the next four weeks, and therefore a close observation of children during this period should bring to light instances of rheumatic heart disease at their very beginning. It may be said that to make an early diagnosis does not amount to prevention, but it would seem that when early diagnosis is combined with prompt and prolonged treatment, the prospect of the heart returning to normal is considerably enhanced. It is high time that our health authorities developed an efficient system of following up for a month children who have a sore-throat. In this country such work would be well undertaken by the school medical service operating in conjunction with the local practitioners and with a rheumatism supervisory clinic.

During the last six years prevention, or perhaps it would be better to say early diagnosis, on the lines indicated above has been attempted in Walthamstow, one of the boroughs of Greater London, where Dr. A. T. W. Powell, the medical officer of health, has examined all patients under 15 years of age on their discharge from the local fever hospital after scarlet fever and diphtheria. Those who showed any abnormal cardiac signs were referred to the Walthamstow Rheumatism Clinic, first for a more precise diagnosis, and then for treatment or supervision. The results have been as follows :—

In all 3050 children have been examined after leaving the fever hospital; 153 children with abnormal cardiac signs were referred to the Rheumatism Clinic, and of these 33 (1 per cent. of those originally examined) were accepted as showing signs of rheumatic carditis. Those in whom this diagnosis was not accepted were found to be suffering from a variety of cardiac abnormalities such as congenital heart disease, nervous tachycardia, and functional bruits. These were kept under observation for a period varying from three months to four years, but evidence of rheumatic carditis did not materialise in any of them. Turning to the 33 children with early involvement of the heart, in 22 there was evidence of dilatation, and in 26 there was a systolic murmur at the apex conducted to the axilla. A short sharp first sound but no murmur was present in 5, and 5 had a mitral diastolic as well as a systolic murmur. Treatment at home, or in hospital, or in the special country heart homes was arranged for these, followed by supervision at the Rheumatism Clinic on their return to school. A follow-up could not be maintained in 7 of these children, either because the parents had left the district, or from difficulty in obtaining coöperation. Of the remaining 26 no less than 15 are regarded as having recovered completely, that is to say there is now no clinical evidence of any abnormality in the heart.

Even if we assume that carditis has persisted in the 7 cases not followed up, we are left with a recovery-rate of 45 per cent., which I submit supports the contention that the early diagnosis of rheumatic heart disease combined with prompt treatment and prolonged supervision makes for a much improved prognosis.

As would be expected, the prognosis was least satisfactory in those cases showing a diastolic as well as a systolic murmur. The after-history of these children has been as follows :—

One child after four years is developing signs of mitral stenosis; another was under observation for two years and then left school, at which time it was noted that there was a long mitral systolic murmur and shortness of breath on exertion. The third and fourth children had organic mitral systolic bruits after three and five years respectively, but were able to take part in full games and exercises at school, while in the fifth child the heart appeared perfectly normal after 18 months and has remained so for a further two years.

The points in this investigation which I would like to emphasise are that a follow-up of children who have had an acute sore-throat can be organised by public health authorities, that the diagnosis of early heart disease is to be expected in only about 1 per cent. of the children examined, and that this method of tackling the disease offers a means of limiting its ravages.

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PORPHYRINURIA FOLLOWING SULPHANILAMIDE:

SULPHANILAMIDE DERMATITIS *

BY CLAUDE RIMINGTON, M.A., Ph.D.Camb., B.Sc.Lond.

ASSISTED BY

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THE antistreptococcal drugs of the benzene-sulphonamide series—Prontosil, sulphanilamide and their derivatives—are finding extensive employment in clinical practice, but not without the appearance of toxic symptoms in a varying proportion of cases. Cyanosis, methæmoglobinæmia, and sulphæmoglobinæmia are very commonly observed, even during treatments of short duration, but when the dosage has been higher and the treatment more prolonged, symptoms of a more alarming character have not infrequently appeared. Among these may be mentioned nausea, vomiting, colic, anæmia, icterus, hæmoglobinuria (Kohn 1937), polyneuritis (Hüllstrung and Krause 1938), agranulocytosis and a dermatitis or toxic rash (compare Douthwaite 1937). A precipitate fall in the number of red blood-cells has also been recorded, without at the same time any evidence being discernible of hæmolysis or icterus (Jennings and Southwell-Sander 1937).

* A preliminary announcement of the results of this work was made before the Biochemical Society on Jan. 14th (see *Chemistry and Industry*, 1938, **57**, 87).

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These toxic manifestations have been discussed in several recent reports, but it is a matter of some difficulty to gauge their frequency, since different dosage schemes have been employed by different investigators (Crean 1937, Jennings and Southwell-Sander 1937, Cokkinis 1937, and Fitch 1937). Snodgrass and Anderson (1937), using for erysipelas patients an average dose of 41·6 grammes spread over 14·4 days, reported the following frequencies of toxic symptoms: cyanosis 29·6 per cent., toxic eruptions 2·2 per cent., drug fever 2·2 per cent., severe vomiting 1·5 per cent. Colebrook and Purdie (1937) in 106 puerperal cases observed cyanosis in over a half, a recurrence of pyrexia in nearly a third of the non-fatal cases, slight jaundice in 2 cases, and occasional transient skin eruptions.

Of particular interest is the rash or dermatitis which has appeared in a proportion of cases (6 per cent. in the series of Schwentker and Gelman, 1937), and which has been clearly shown in several instances to be associated with exposure to sunlight (Menville and Archinard, 1937; Newman and Sharlit, 1937; Frank, 1937). In the majority of cases the rash has been described as a purpuric, scarlatiniform or maculopapular eruption developing on about the 8th or 9th day of treatment and affecting principally exposed skin surfaces such as the face and neck, backs of the hands, &c., although it may spread to such a degree as to involve the whole of the trunk. Upon withdrawal of the drug, the eruptions have generally subsided within a few days (compare, however, Finney, 1937), but by further dosage they could once more be elicited (Unshelm, 1937; Goodman and Levy, 1937; Newman and Sharlit, 1937). This circumstance combined with their somewhat capricious appearance has led several investigators to postulate an individual idiosyncrasy of the affected patients towards the drug employed (e.g., Schonberg, 1937). Experiments designed to reveal an allergic response have, however, consistently failed (compare Goodman and Levy, 1937).

That sunlight appears to be a contributory factor in a sulphanilamide rash would suggest that the patient has become photosensitised, and Brunsting (1937), working upon this hypothesis, reported two analyses of urines from dermatitis cases in which he found urinary porphyrin to be increased. His results cannot be considered as more than suggestive, since it is a well-known fact that many states of fever or infection lead to increased porphyrin output.

Up to the present the most complete study of the pharmacological actions of sulphanilamide is that of Hawking (1937), but this investigation was only concerned with the acute toxic effects. The symptoms of poisoning he records in cats and rabbits, following 1·5 to 2 g. of sulphanilamide per kg. body-weight, recall the condition of decerebrate rigidity and bear little resemblance to the toxic effects experienced by human patients.

Hageman (1937) has investigated the effects upon mice of sub-lethal doses of prontosil or sulphanilamide administered over periods up to 14 days in length, the animals being killed and their livers, kidneys, spleens, and bone-marrow, taken for histological examination at varying periods after the drug was discontinued. No noticeable lesions were present in the liver or kidneys, but the number of eosinophil cells in the bone-marrow was increased even after one or two days of sulphanilamide treatment. Deposits of hæmosiderin were found in the spleen, the quantity increasing with the total dosage and the duration of life after treatment. This fact led Hageman to the conclusion that the pathological changes responsible for the accumulation of this pigment were progressive, and continued even after the drug was stopped. As a result of the present study upon porphyrin excretion, we are led to a somewhat similar conclusion.

Since increase in porphyrin excretion can be accepted as indicating a disturbance in hæmopoiesis or in liver function, it was decided to investigate more closely the effect of sulphanilamide (*p*-aminobenzenesulphonamide) on such excretion when administered to patients undergoing treatment for infection with hæmolytic streptococci, and also when given to normal healthy rats maintained on a constant, artificial diet.

Clinical Observations

Through the kind coöperation of physicians and hospital staffs, a number of 24-hour specimens of urine from patients undergoing sulphanilamide treatment were made available to me (C. R.) for porphyrin determination.

A 1 litre sample of the specimen is acidified with 100 c.cm. of glacial acetic acid and the mixture extracted by ether for 8 to 12 hours in the continuous extraction apparatus of Kutscher and Steudel. The use of such an apparatus affords a saving in both time and solvent and guards against the formation of troublesome emulsions. It can, however, be dispensed with, the acidified urine being shaken instead with two consecutive 1 litre volumes of ether in a large separatory funnel. The ether-soluble porphyrins of the urine are extracted completely by this procedure. The ether extract is washed several times with water to remove acetic acid and then shaken with 2 c.cm. portions of 5 per cent. (by weight) hydrochloric acid until no further porphyrin is removed (controlled by spectroscopic examination or fluorescence in ultra-violet light). Usually, two successive shakings suffice to extract the porphyrin completely. Quantitative determination is best effected by comparison of the intensity of the 550 mμ absorption band in the acid solution with that of a standard containing 1 mg. of coproporphyrin in 100 c.cm. of 5 per cent. hydrochloric acid. Comparison may be carried out in a Zeiss comparison spectrocolorimeter, or by the simple expedient of diluting the unknown progressively to match the standard, both solutions being contained in test-tubes of approximately 1 cm. diameter, and viewed by a pocket spectroscope such as the Browning. An example illustrates the calculation involved.

Volume in 24 hours = 1620 c.cm.
Sample taken = 1000 c.cm.
Extract diluted to 10·4 c.cm. to match standard.

$$\therefore \text{Porphyrin content} = \frac{10{\cdot}4 \times 1620}{1000} = 169\,\gamma$$

The experimental findings are given in Table I. The normal daily output of urinary porphyrin lies between 0 and 50 γ, values outside this range being regarded as abnormal by Schreus and Carrié (1933). It will be seen that in nearly every instance patients receiving sulphanilamide at the time of, or immediately prior to, collection exhibited a striking increase in the amount of porphyrin in the urine, values up to nearly ten times the normal maximum being recorded. This porphyrinuria was even maintained to a large degree for some time after the drug was discontinued. Since sulphanilamide is said to be rapidly excreted from the body (Marshall, Emerson, and Cutting, 1937a, b) such continued excretion of porphyrin suggests that the abnormality must be due to a lesion of some persistence. Attention may be drawn to Case 6, treated for puerperal sepsis by 9 g. of sulphanilamide spread over three days. After withdrawal of the drug there was a marked fall in porphyrin excretion, but on the fourth day the figure returned

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to a high level. No more determinations were possible since the patient was discharged at this juncture.

Included in this series is a case (No. 9) which exhibited a well-marked toxic rash. The patient had received only 4·5 g. of sulphanilamide for a septic throat and had been discharged from hospital.

TABLE I—URINARY EXCRETION OF ETHER-SOLUBLE PORPHYRIN (24-HOUR PERIODS) DURING OR AFTER SULPHANILAMIDE TREATMENT

Case.	—	Dosage.	Urine volume (ml.).	Porphyrin content (γ).	Temp. during collections.
1	Puerperal septicæmia (24 hr. after drug stopped).	21 g. in 7 days.	765	246	99·4°–101° F.
2	Puerperal septicæmia.	49 g. in 11 days.	1800	10	97°–98° F.
3	Puerperal septicæmia.	51 g. in 11 days.	1830	205	100°–101·2° F.
4	Scarlet fever. Marked sulphæmoglobinæmia (24 hr. after drug stopped).	24 g. in 4 days.	1250	140	97·4°–98° F.
5	Puerperal septicæmia. Rash 4 days before (5 days after last dose).	44 g. in 8 days.	2430	50	..
6	Puerperal septicæmia.	9 g. in 3 days. (Dec. 11-14)			
	Prior to dosing Dec. 10–11	..	1780	127	103° F.
	During " " 12–13	..	1630	140	Normal.
	" " " 13–14	..	950	142·5	"
	Day after " " 14–15	..	1400	77	"
	2 days " " " 15–16	..	575	About 5	"
	4 " " " " 17–18	..	1620	169	"
7	Sinusitis.	Prolonged dosing.	1025	126·2	..
8	Septicæmia after accident, prolonged fever.	150 g. at intervals over 6 wk.*			
	During dosing Dec. 15–16	..	1200	463	..
	Day after " " 17–18	..	1100	184·7	..
	Intermittent dosing " 22–23	..	850	222·5	..
	Intermittent dosing Jan. 2– 3	..	825	386·7	..
9	Tonsillitis. Rash 2 days after dosing stopped.	4·5 g. in 2 days.			
	8-hr. specimen 4 days after dosing stopped (Jan. 4).	..	340	18 (54 in 24 hr.)	..
	Jan. 4– 5.	..	1340	42·2	..
	" 5– 6.	..	720	16·6	..
	" 6– 7.	..	450	55	..
	" 7– 8.	..	2365	32·3	..
	" 8– 9.	..	2040	165·8‡	..
	" 9–10.	..	670	Trace.	..
10	Puerperal septicæmia.	15 g. in 5 days.	2210	55	..
11	Septic throat.	7 g. in 4 days.†			
	Jan. 7– 8.	..	550	75	..
	" 8– 9.	..	400	44	..
	" 9–11.	..	1220	92·4	..
	" 11–12.	..	710	42·6	..
	" 12–14.	..	1400	204	..
12	Septicæmia, Jan. 13–14.	..	500	357	..

* Plus 19 g. red Prontosil (Nov. 8–Dec. 16).
† Last dose Jan. 7, pronounced sulphæmoglobinæmia.
‡ Hæm. strept. A sore-throat. Urine dark brown.

She returned the following day with a rash which affected the greater part of the trunk, and was put to bed under observation. Urinary porphyrin analysis from the 4th until the 6th day after the drug was stopped showed figures declining from a value slightly above the normal level. It was decided once more to test the patient's reaction to sulphanilamide and accordingly urine specimens were collected and analysed daily. No irregularity was observed except that on Jan. 8th and 9th the porphyrin figure rose to 165·8 γ, only to fall again markedly the following day. Upon inquiry, it transpired that the original plan had been abandoned, since mammary carcinoma had been diagnosed and immediate operation was contemplated. On Jan. 8th to 9th, however, the patient had developed a severe hæmolytic streptococcal (type A) sore-throat. It was on these days that an increase in porphyrin excretion was registered, a circumstance emphasising again the necessity of studying the action of a drug upon healthy normal organisms.

Observations on Rats

It was felt that the action of sulphanilamide upon the hæmopoietic system could only be properly studied in healthy organisms. Adult white rats weighing about 200 to 250 g. were placed in groups of three in metabolism cages and their urine and fæces were collected over three-day intervals and analysed for ether-soluble porphyrins. A few drops of toluol were added to the urine collection flasks to prevent bacterial growth. The *standard diet* was as follows:—

Casein, 20 per cent.; rice starch, 73 per cent.; salt mixture, 2 per cent.; yeast powder, 5 per cent.; cod-liver oil 20 c.mm. per rat per day.

Salt mixture: sodium chloride, 41·6 g.; magnesium sulphate, 130·2 g.; acid sodium phosphate, 83·2 g.; potassium phosphate, 228·8 g.; calcium biphosphate, 129·6 g.; ferric citrate, 47·2 g.; calcium lactate, 146·2 g.

Each animal received 10 g. made into a paste with 10 c.cm. of water. The food was offered to each rat individually for one hour in the morning and anything remaining for one hour in the afternoon (a single two-hour period on Saturdays and Sundays), the uneaten residue being then weighed. The drug was administered by admixture with the ration and in this way the exact intake of each individual could be computed (see Table II). A pre-period was

TABLE II—DOSAGE OF SULPHANILAMIDE PER RAT

—	Amount added to daily ration.	Average daily amount consumed.	Total consumed.
Controls ..	Nil.	Nil.	Nil.
Group 1 (♂) ..	0·4 g.	0·307 g.	8·3 g. in 27 days.
" 2 (♂) ..	0·3 g.	0·278 g.	10·0 g. in 36 "
" 3 (♀) ..	0·1 g.	0·079 g.	2·6 g. in 33 "

included for each group and a group of three rats served as controls. Body-weights were recorded throughout the experiment.

The results presented in Table III show that a marked rise in urinary porphyrin excretion occurred in each group—the maximum figures ranging from twice to nearly ten times the normal. This high level of porphyrin excretion continued for some considerable time after dosage was discontinued. In the case of Group 2, determinations of urinary sulphanilamide by the method of Marshall (1937) were carried out concurrently with porphyrin determinations and tend to show that excretion of the drug in the case of the rat after prolonged dosage is not complete for some 21 days. The drug was withdrawn on Dec. 31st and excretion was as follows:—

Jan.	Sulphanilamide (mg.).	Porphyrin (γ).	Jan.	Sulphanilamide (mg.).	Porphyrin (γ).
1– 3 ..	81·0 ..	260	13–15 ..	11·9 ..	80
4– 6 ..	— ..	120	16–18 ..	11·4 ..	70
7– 9 ..	16·2 ..	85	19–21 ..	1·5 ..	60
10–12 ..	11·0 ..	84	22–24 ..	Nil. ..	60

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Photosensitivity.—Attempts were made to reveal photosensitivity by exposing the animals, together with the controls, to the light of a mercury-vapour lamp after having previously shaved off the hair from the sides and back. Exposures of 5 and 10 minutes at a distance of 24 inches were unsuccessful, but all three rats of one sulphanilamide group given exposures for 10 and 15 minutes at this distance on each of two consecutive days developed typical cutaneous lesions, whereas the controls showed only a slight transitory erythema. The degree of photosensitivity appeared to be of a very low order, a fact which became readily explicable when it was found that the increased urinary porphyrin is coproporphyrin III. The series III porphyrins are known to be much less active photosensitising agents than are their series I isomers (compare Bingel, cited by Mertens, 1937b). This point is again referred to in the discussion, when considering sulphanilamide dermatitis in human beings.

TABLE III—SULPHANILAMIDE INTAKE AND PORPHYRIN EXCRETION IN RATS OF EXPERIMENTAL GROUP 1 (3 MALES). MEAN DOSE 0·307 G. PER RAT PER DAY

Date.	A: Sulphanilamide, actual intake (g.).	A: Wt. (g.).	B: Sulphanilamide, actual intake (g.).	B: Wt. (g.).	C: Sulphanilamide, actual intake (g.).	C: Wt. (g.).	Urine volume (ml.).	Urine porphyrin (γ).	Fæces weight (g.).	Fæces porphyrin (mg.).
Nov.										
8	..	240	..	211	..	270				
9							40	35·0	4·8	0·65
10										
11										
12	..	234	..	202	..	259	63	32·5	3·6	0·68
13										
14										
15							55	..	4·0	0·72
16	..	237	..	203	..	259				
17										
18							57	35·0	6·2	0·70
19	..	236	..	204	..	258				
20										
21										
22	0·475	..	0·375	..	0·400	..				
23	0·200	243	0·125	206	0·375	257	225	57·5	2·2	0·48
24	0·225	..	0·100	..	0·375	..				
25	0·238	..	0·063	..	0·250	..				
26	0·262	230	0·175	187	0·280	246	169	92·5	3·6	1·00
27	0·240	..	0·060	..	0·220	..				
28	0·340	..	0·240	..	0·300	..				
29	0·300	..	0·200	..	0·400	..	132	130·0	4·3	1·20
30	0·320	217	0·200	175	0·400	232				
Dec.										
1	0·240	..	0·160	..	0·220	..				
2	0·380	..	0·220	..	0·400	..	111	125·0	4·3	1·10
3	0·380	212	0·220	171	0·340	224				
4	0·180	..	0·200	..	0·300	..				
5	0·380	..	0·160	..	0·400	..	94	125·0	4·6	1·25
6	0·380	..	0·220	..	0·400	..				
7	0·240	206	0·240	159	0·400	215				
8	0·400	..	0·300	..	0·400	..	99	137·5	3·4	0·50
9	0·400	..	0·260	..	0·400	..				
10	0·340	..	0·360	163	0·400	220				
11	0·180	..	0·180	..	0·340	..	101	190·0	4·0	0·85
12	0·400	..	0·340	..	0·400	..				
13	0·400	..	0·360	..	0·400	..				
14	0·340	204	0·220	163	0·400	218	92	210·0	2·7	0·50
15	0·400	..	0·360	..	0·400	..	Exposed to U-V for 5 min. at 24″.			
16	0·400	..	0·360	..	0·400	..	Exposed to U-V for 10 min. at 24″.			
17	0·360	205	0·380	165	0·400	223	118	290·0	3·4	0·55
18	0·380	..	0·360	..	0·280	..				
19	0·325	..	0·238	..	0·359					
20							32	165·0	3·2	0·75
21		206		176		229				
22							32	105·0	2·8	0·50
23	Mean		Mean		Mean					
24	daily	205	daily	165	daily	223	99	175·0	4·5	0·55
25	intake.		intake.		intake.					
26										
27							98	77·5	4·0	0·80
28										
29										
30							79	80·0	4·5	0·75
31		208		178		231				
Jan.										
1	0·200	..	0·240	..	0·240	..				
2	0·340	..	0·040	..	0·400	..	69	120·0	3·4	0·80
3	0·220	201	0·240	170	0·240	229				
4	0·340	..	0·240	..	0·360	..				
5	0·360	..	0·300	..	0·400	..	88	150·0	2·3	0·70
6	0·380	..	0·300	..	0·360	..				

No attempt has been made to reproduce the complete data for each group. In Group 2 (3 males) the mean dose of sulphanilamide was 0·278 g./rat/day administered for 36 days and the urinary porphyrin excretion attained a maximum of 260 γ. Similarly Group 3 (3 females) received on the average 0·079g./rat/day for 33 days and attained a maximum of 60 γ.

In a control group of 3 male rats the urinary porphyrin excretion averaged 35·2 γ with minimum and maximum figures of 20 γ and 45 γ respectively.

The full record will willingly be submitted to anyone sufficiently interested.

It may be pointed out that there was a very marked increase in the volume of urine passed, especially for the first few days, when sulphanilamide was added to the diet. The experimental animals declined somewhat in weight during the period, despite fairly well-maintained appetite, and this loss of weight may in part be accounted for by a dehydration of the tissues. At the close of the experiment, individuals from each group were killed by coal gas and their organs taken for histological examination.

ISOLATION AND IDENTIFICATION OF THE PORPHYRINS

Rat urine.—The acid extracts were accumulated until sufficient (about 250 c.cm.) had been obtained to make isolation of the porphyrin possible. The pigment was transferred to ether and then back to 25 per cent. hydrochloric acid. This solution was shaken several times with chloroform to remove any protoporphyrin or bile pigments. Finally, by means of potassium acetate, the porphyrin was taken back to ether. This red solution showed the absorption spectrum of coproporphyrin. It was evaporated, the residue esterified, taken into chloroform, thence to 5 per cent. hydrochloric acid, back to a small volume of ether, and this solution dried and evaporated. A crystalline residue consisting of fine needles in clusters was obtained. After washing with petroleum, it was treated with dry ether which dissolved all but a trace of pigment, too small to recrystallise for exact melting-point determination. The ether solution was allowed to evaporate and deposited crystal clusters in the typical habit of coproporphyrin III, M.P. 142°–144° F., remelt 166° F. Mixed with synthetic coproporphyrin III ester (M.P. 144°–146° F.), the gift of Prof. H. Fischer, it had M.P. 142°–146° F. The copper complex was also prepared and crystallised in fine red needles, M.P. 192° F. The identity of the porphyrin with coproporphyrin belonging to the isomeric series III (see discussion) is thus proved.

Human urine.—From the human urines, treated in a similar way, coproporphyrin III ester, M.P. 169°–171° F. was isolated,† and about an equal quantity of the ether-insoluble ester of coproporphyrin I. This was recrystallised five times from chloroform-methyl alcohol and finally had M.P. 241°–244° F.

The trace of porphyrin present normally in rats' urine—about 3γ per rat per day—is in all probability coproporphyrin I, as this is the isomer occurring in healthy human urine.

Rats' fæces are normally fairly rich in protoporphyrin. The increase which occurred in fæcal porphyrin excretion as the result of sulphanilamide dosing was shown to be due mainly to coproporphyrin III. The accumulated pigment was precipitated from acid solution by neutralisation to *p*H 3·7. The precipitate was dissolved in acetic acid and much ether added, after which the mixture was shaken repeatedly with water until acetic acid was removed. A small deposit forming at the liquid interface proved to be a porphyrin metal complex together with some brown material. Coproporphyrin was removed

† Coproporphyrin III methyl ester exhibits a double melting-point, 144°–146° F. and 172° F. The lower melting form, upon cooling and reheating, melts in the vicinity of the higher temperature.

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from the ether by repeated shaking with 1 per cent. hydrochloric acid, and any protoporphyrin simultaneously carried over was eliminated by a vigorous shaking with chloroform. The pigment remaining in the acid was transferred to ether, the solvent evaporated, and the residue esterified. The ester solution was now put through the same scheme of separation as outlined above in the case of the urinary pigment, with the result that there was obtained coproporphyrin III ester, M.P. 140° F., together with coproporphyrin I ester, M.P. 238°–240° F.

For identification of the protoporphyrin, this fraction was removed from the ether by 5 per cent. hydrochloric acid, transferred back to ether and the solvent evaporated. The residue was now boiled for 4 minutes in a mixture of acetic acid and hydrogen iodide (7·5 to 1), to convert it into the corresponding mesoporphyrin, and excess of these reagents removed by diluting with much ether and washing the solution repeatedly with a mixture of sodium acetate and sodium sulphite, and finally with water. The porphyrin was now removed by 2 per cent. hydrochloric acid and this solution made just alkaline with sodium hydroxide. Separation of the sparingly soluble sodium salt of mesoporphyrin commenced at once, but the precipitate was only removed by centrifugation after some hours at ice temperature. The mother liquor was still deeply coloured and exhibited a strong porphyrin spectrum. Since it was considered possible that some series I pigment might be present, a very careful investigation of the supernatant was carried out, utilising the facts established by Fischer and his co-workers that the sodium salt of synthetic mesoporphyrin of series I is much more soluble than that of the series III isomer. All fractions obtained proved, however, to be similar when esterified and crystallised. The main sodium precipitate was treated with methyl-alcoholic hydrochloric acid, and the pigment ester purified by way of chloroform, 5 per cent. hydrochloric acid and ether. It separated in prismatic needles, M.P. 207°–210° F. Mixed with mesoporphyrin IX ester from Prof. H. Fischer (215°–216° F.) it had M.P. 207°–213° F. The protoporphyrin normally present in rats' fæces is thus a series III derivative possessing the same configuration as blood hæmatin.

An examination for the presence of uroporphyrins in the human clinical urines was made by means of chromatographic adsorption and also by ethyl acetate extraction, but minute traces only appeared to be present.

POST-MORTEM FINDINGS

The animals slaughtered were selected as follows :—

1.—Rat B of Group 1 (0·307 g. drug), killed whilst still receiving sulphanilamide. The group were excreting about six times the normal amount of porphyrin.

2.—Rat A of Group 1, killed 18 days after drug was discontinued.

3.—Rat B of Group 3 (0·079 g. drug), killed whilst still receiving sulphanilamide. The group were excreting about 2½ times the normal amount of porphyrin.

4.—Rat A of Group 3, killed 18 days after drug was discontinued.

5. and 6.—Rats B and A of Group 2, killed 28 days after drug (0·278 g.) was discontinued and porphyrin excretion had returned nearly to normal. Sulphanilamide no longer present in the urine.

7, 8, and 9.—Controls of approximately the same age and weight, maintained on the same diet.

The findings were :—

1.—General appearance of carcass more brown than usual after CO poisoning. Neither met- nor sulph-hæmoglobin could be detected in the heart blood. Liver: rather small. Spleen: enlarged and blackish-brown in colour. Otherwise organs appear normal.

Histological examination.—Liver: poor in glycogen; small amount of stainable iron; some brownish pigment granules to be seen—e.g., in star cells. Otherwise normal. No excessive fat. Kidneys: a certain quantity of orange-brown pigment in the convoluted tubules. Otherwise normal. Spleen: intensely engorged; sinuses very much enlarged, dilated with red cells. Large accumulation of greenish-brown pigment in the cells lining the pulp. The prussian-blue reaction showed a quantity of stainable iron. When viewed by ultra-violet fluoresence microscopy, an orange-red fluorescence was seen in those regions where the greatest accumulation of brown pigment occurred. Porphyrin is thus present in the spleen, which appears to be the organ most severely affected by the drug. Bone-marrow: appears normal. Possibly fewer immature cells than in the controls.

2.—The spleen still contained a quantity of stainable iron and accumulations of greenish-brown pigment. In the liver a small quantity of iron was present both in the form of granules and in diffusely staining masses. The quantity, though slight, was greater than in No. 1.

3.—The appearance of all organs resembled closely that of rat No. 1, the accumulation of stainable iron and brownish pigment in the spleen being only slightly less marked. The liver was poor in glycogen, but contained no abnormal quantity of fat. In the kidneys the same greenish-brown granules were seen in the cortex as were visible in rat No. 1.

4.—Rather less iron in the spleen than in No. 3; otherwise similar. In the liver more iron was again seen than was present in No. 3. Both diffuse masses and granules were visible.

5.—Only spleen and liver examined. Very considerable deposits of stainable iron in the spleen. Slightly more iron in the liver than in that of the controls.

6.—Only spleen and liver examined. Resembled No. 5 very closely in all respects.

7, 8, and 9.—No abnormalities present in any of the organs examined; in particular, the spleens contained only traces of iron stainable by the prussian-blue reaction.

Discussion

It is clear from the feeding experiments on rats that sulphanilamide, in the dosage employed, causes a very marked porphyrinuria which persists for some time after the drug is discontinued. The porphyrins isolated were coproporphyrin III and a trace of coproporphyrin I from the urine, and the same two pigments from the fæces, but with a greater proportion of coproporphyrin I.

Fischer and his collaborators have shown that the pigments of blood and bile all belong to the set of isomers designated series III (theoretically derivable from ætio-porphyrin III), whereas in congenital porphyrinuria and certain other conditions such as sulphonal poisoning, pigments belonging to series I are excreted. The latter cannot be derived by breakdown of red blood-cells, but must arise owing to some derangement of hæmatopoietic processes in the bone-marrow (compare Rimington, 1936, 1938). Coproporphyrin III excretion has so far been found to be associated either with some impairment of hepatic function—for example, in cirrhosis of the liver (Dobriner, 1936), chronic alcoholism (Brugsch, 1937)—or with intoxication as by salvarsan (Schreus 1935) or lead (Grotepass 1932; Fischer and Duesberg 1932; Mertens 1937a; Watson 1936). That sulphanilamide does occasion destruction of red cells seems certain, and it is suggested that any further work on this aspect of the drug's action should include a systematic study of the fæcal urobilin output.‡ That the increased porphyrin output is directly attributable to the disintegration upon normal lines of the released blood pigment

‡ In the course of the present investigation a few determinations of urinary urobilin were made, but values were found which were not strikingly abnormal. The acid ether extracts of the rats' fæces, however, contained at one time unusually large amounts of pigments which were definitely bilirubinoid in character and which imparted a brownish hue to this fraction and a purple-blue colour to the final acid shakings.

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is not a readily acceptable hypothesis, since the balance of evidence goes to show that the change of hæmoglobin into bilirubin does not normally pass over a porphyrin stage (compare Rimington 1936). Moreover, the increased output of coproporphyrin I in the human urines demands some other origin for this isomer.

It is tempting to compare the situation with that in lead poisoning, where it has been postulated that the drug possibly acts by interfering with the mechanism of the incorporation of iron into protoporphyrin to produce hæmatin (Rimington 1938).

The series III pigments are less active as photosensitisers than are their series I analogues, and thus the rarity of severe photosensitisation in patients exhibiting a high grade sulphanilamide porphyrinuria becomes explicable. Still further, it is possible that the proportion of series I to series III pigments formed may vary in different individuals, according to the exact way in which the pigment metabolism of the body is affected. Such individual differences might conceivably bear some relation to the recorded idiosyncrasy displayed by certain individuals towards the drug—more especially as regards the manifestation of toxic symptoms and dermatitis. In this connexion it is of interest to recall that the symptoms exhibited by patients suffering from acute porphyrinuria—namely, nausea, colic, vomiting, constipation, muscular weakness, &c.—bear a certain resemblance to those encountered as a result of sulphanilamide toxicity.

During the present investigation an insufficient number of cases of dermatitis was available for a definite conclusion to be drawn with regard to its cause. In certain instances on record, exposure to sunlight would certainly seem to have played a major rôle in its development, and that photosensitising pigments are liberated in the organism as a result of sulphanilamide therapy has been amply proved by the present investigation. Nevertheless, the possibility cannot be excluded that a form of drug dermatitis may occasionally develop, which is not a result of photosensitisation in the usually accepted sense of the term.

The dosages employed in the experiments upon rats varied from approximately 0·4 g./kg. to 1·5 g./kg., figures higher than the generally accepted therapeutically effective mouse or rabbit dose—about 0·25 g./kg. to 1 g./kg.—but according to Dyke (1937) a 50 per cent. acute mortality in mice was only produced by 80 mg. of sulphanilamide, that is by 4 g./kg. In combating severe human infections it has not been uncommon to employ frequently repeated doses of 5 g. or more, and in one instance 90 g. of sulphanilamide was administered during the course of 7 days.

The quantity administered at any one time is, however, perhaps of less significance than the total quantity of the drug distributed in the organism, and in this connexion it is of interest that dermatitis has been reported to occur usually about the 8th or 9th day. Certain individuals may begin to show physiological intolerance at an earlier stage than others, and for this reason Colebrook and Purdie (1937) pointed out that a method by which hypersensitiveness to sulphanilamide could be detected at an early stage would prove of enormous value in clinical work. It is believed that the routine determination of urinary porphyrin may fulfil this requirement—at any rate the suggestion is made that it merits a careful trial and assessment in the light of clinical experience. That the drug is not wholly innocuous must be conceded, and as a result of the present investigation it would appear that it is capable of exerting an action, hitherto unsuspected, upon the pigment metabolism of the body.

Summary

The urines of hospital patients treated with sulphanilamide (*p*-aminobenzenesulphonamide) have been analysed for ether-soluble porphyrin content, and abnormally high values recorded in nearly every case.

Sulphanilamide has also been administered by addition to the artificial diet of normal healthy white rats in doses averaging 0·307 g., 0·278 g., and 0·079 g. per rat per day for periods up to 30 days. A marked increase in urinary and fæcal porphyrin excretion resulted in each instance, values as high as ten times the normal being recorded. The animals developed a polyuria during the first days after dosing was instituted and declined somewhat in weight. No other signs of toxicity were observed. The presence of a slight degree of photosensitivity was determined as the result of exposure to ultra-violet irradiation.

Isolation and chemical examination of the excreted porphyrins identified them as coproporphyrin III together with a trace of coproporphyrin I in the urine, and the same two pigments with a greater proportion of series I isomer in the fæces. The normally occurring protoporphyrin of rats' fæces has been identified as belonging to series III by conversion into the corresponding mesoporphyrin IX (M.P. 207°–210° F.). From the human clinical urine specimens, coproporphyrins I and III were isolated in approximately equal quantity. The significance of these findings is discussed and it is pointed out that the symptoms of acute porphyrinuria bear some resemblance to those reported as a result of sulphanilamide intoxication. The relative proportions of series I and III porphyrins may prove helpful in explaining individual idiosyncrasies towards the drug, especially as regards the manifestation of sulphanilamide rash or dermatitis. Quantitative determination of porphyrin excretion may possibly serve as a means of assessing hypersensitiveness towards sulphanilamide.

When dosage of the drug to rats is discontinued a slow return of the urinary porphyrin figure towards the normal level occurs, but this may take several weeks.

Animals killed at the height of sulphanilamide dosing exhibit only a slight degree of histological abnormality in the liver and kidneys, but the spleens are of a blackish-brown colour, much engorged, and show extensive deposits of a greenish-brown granular pigment, much stainable iron, and a certain amount of porphyrin (observed fluoroscopically). The histological picture had not returned to normal within 28 days after dosing of sulphanilamide was discontinued.

The available evidence would suggest that a certain degree of blood-cell destruction is caused by sulphanilamide in the doses employed, but it is felt that the disturbance in pigment metabolism is not to be explained by this fact alone. A more deep-seated effect upon the hæmopoietic system is suspected, analogous, possibly, in some ways to the toxic action of lead.

I am indebted to Dr. R. Cruickshank and the medical superintendent of the L.C.C. North Western Fever Hospital; to Dr. L. Colebrook, Dr. Meave Kenny, and Prof. G. G. Turner, who provided me with material from their cases; to Mr. T. A. Webster for suggestions, and to J. Rogers and W. Bliss for their assistance in the care of the animals.

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SIGNIFICANCE OF FITS IN THE INSULIN THERAPY OF SCHIZOPHRENIA

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THE insulin therapy of schizophrenia according to Sakel's (1935) technique consists in giving intramuscular injections of insulin in daily increasing quantities until a dose is reached which produces coma approximately three hours later. Coma is maintained for one to two hours and then terminated by administration of glucose. Unless remission is effected earlier, 50 or more comas are given as a course of the treatment.

Fits, usually preceded by twitchings and jerkings, are frequent complications; 25–77 per cent. of patients so affected have an average of four each, mainly in the first half of a course (Greenwood 1935, Parfitt 1937). They may occur at any time before or during or after the coma and call for immediate interruption of hypoglycæmia. Their ætiology is not yet satisfactorily explained. Sakel observed them more often in patients with little or no perspiration during hypoglycæmia—what he called "dry shocks"—and œdema of an irritable cortex has been suggested as a cause (Greenwood 1935, Ewald 1937). Incomplete carbohydrate metabolism, and therefore excess of pyruvic acid and methylglyoxal in the brain cells owing to deficiency or destruction of vitamin B_1, the necessary catalyst, has been demonstrated in animals (Peters 1936). It has been stated that the injection of this vitamin reduces considerably the incidence of fits in rabbits subjected to hypoglycæmia (Demole 1937). Clinical use of vitamin B_1 has been made by Freudenberg (1937) to overcome the excessive sensitivity of some patients towards insulin and to hasten the delayed return to consciousness after interruption of hypoglycæmia with glucose; but up to the present there is no clinical evidence that it inhibits fits in insulin therapy. Although these fits are clinically identical with ordinary major epileptic attacks, it has been thought that their cause is different, because epileptics have not been observed to be prone to have them in hypoglycæmia (Day and Niver 1937). Recent reports on two schizophrenics with histories of previous seizures, and an epileptic who had not had a fit for several months, show that they developed frequent fits in the pre-coma and post-coma periods of hypoglycæmia (Parfitt 1937). It is interesting to note that these patients have not had fits during coma.

ARE THE FITS BENEFICIAL?

Some psychiatrists incline to the view that fits have a good effect on schizophrenics treated with insulin, but the available evidence suggests that their cause as well as their therapeutic value may differ at the various periods of hypoglycæmia. Of the 22 patients treated at the Three Counties Hospital 6 had fits, as follows:—

Case 10, Table A, a paranoid of four years' psychosis, had 11 fits, approximately two hours before the coma was expected. On the days that 1 grain of phenobarbitone was given he had no fit and coma proceeded quietly. There was no previous history

TABLE A

Case.	Age.	Diagnosis.	Duration of psychosis.	No. of comas.	No. of fits due to hypoglycæmia.	Results.
1	26	Katatonic excitement.	½ year.	22	—	Complete remission.
2	22		„	20	—	
3	23	Katatonic depression.	„	34	1	
4	21	Dementia paranoides.	„	26	2	
5	30	Katatonic depression.	1 „	36	3	
6	28		„	21	3	
7	34	Katatonic excitement.	„	16	4	
8	36	Katatonic depression.	1½ years.	38	—	
9	22	Dementia paranoides.	3 „	79	—	Unimproved.
10	24		4 „	68	11	
11	23	Hebephrenia.	4 „	75	—	
12	36	Dementia paranoides.	Over 5 years.	74	—	

TABLE B

Case.	Age.	Diagnosis.	Duration of psychosis.	No. of cardiazol fits induced in hypoglycæmia.	Results.
1	26	Katatonic depression.	½ year.	6, dose 0·3 g.	Complete remission.
2	25	Dementia paranoides.	1½ years.	4, „ 0·4 g.	
3	23	Katatonic depression.	1½ „	8, „ 0·5 g.	Unimproved.
4	21	Katatonic excitement.	2 „	4, „ 0·4 g.	Complete remission.
5	19	Hebephrenia.	2 „	6, „ 0·4 g.	Partial remission.
6	27	Katatonic depression.	2½ „	8, „ 0·4 g.	
7	27	Katatonic stupor.	3 „	8, „ 0·4 g.	Unimproved.
8	38	Paraphrenia.	Over 5 years.	6, „ 0·5 g.	
9	28	Katatonic stupor.		8, „ 0·4 g.	
10	29			8, „ 0·4 g.	

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of any fits and he had none during the seven months following the completion of the treatment. He remained unimproved.

Five cases (Nos. 3, 4, 5, 6, and 7, Table A) had from one to four fits in coma, a few minutes to an hour and a half after its onset. Their occurrence appeared to be entirely accidental and unrelated to any variations in the coma dose attempted, with a degree of safety. All the patients have shown improvement after each fit, often smiling in a friendly way on regaining consciousness and remaining emotionally balanced and better behaved later. They were all comparatively recent cases, their symptoms (especially hallucinations) disappeared easily and eventually they acquired full insight into their condition before they had the usual minimum number of comas.

No fits after coma were observed in any of the 22 patients treated. Three cases (Nos. 1, 2, 8, Table A) of the remaining 16 which had no fits recovered, but the rest showed no appreciable improvement even with an extended course of over 50 comas. Georgi (1937) advocates in such cases a combination of Meduna's (1937) Cardiazol with Sakel's insulin treatment. He reports that a smaller dose of cardiazol is required to produce a fit in hypoglycæmia and it should be given in the second hour after the injection of the coma dose of insulin, when, according to him, fits in hypoglycæmia are more likely to occur. His technique, somewhat modified, has been applied to 10 of the unimproved patients whose bodily condition was very good. Insulin comas were continued and cardiazol fits have been induced twice a week in the third hour, approximately 15–20 minutes after the onset of the coma, when pulse and respiration were satisfactory. Cardiazol fits were omitted on days when premature incidence of coma was observed, which tended to deepen rapidly, or when respiration was distressed and pulse weak and rapid. Hypoglycæmia was interrupted immediately after the fit by intravenous glucose. There were no accidents and the return to consciousness proceeded as usual. The results are shown in Table B. Of the 10 cases so treated 4 have so far had satisfactory remissions.

All the results were assessed according to Muller's (1936) suggestions and the recommendations of James, Freudenberg, and Cannon (1937), which have been accepted by the Association of insulin therapeutists in this country.

CONCLUSION

It is obvious that the duration of psychosis is the most important factor in the prognosis, but although the number of cases reported in this paper is too small for definite conclusions, I consider that the occurrence of convulsions during the actual coma period of insulin therapy is likely to enhance the value of the treatment, whether these fits occur spontaneously in coma or are induced by injections of cardiazol.

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ENTERIC FEVER

TREATED WITH SUPRARENAL CORTEX EXTRACT AND VITAMIN C INTRAVENOUSLY

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Emile Sergent (1898–1920) drew attention to suprarenal deficiency in infections and to resemblances between typhoid fever and Addison's disease, and reported encouraging results from treating typhoid with suprarenal extract. My own interest in this subject was first aroused by a paper by Alfred Khoury (1912) on typhoid vomiting of suprarenal origin, and I found that in typhoid, as in Addison's disease, the urea and the non-protein nitrogen of the blood were raised and the plasma, chlorides, sugar, cholesterol, and bilirubin were decreased. The low values of bilirubin in typhoid, when high values would be expected because of the enlargement of the liver and spleen and the toxic typhoidal state, are due, I believe, to a defensive mechanism (Najib-Farah 1938). Intravenous injections of adrenaline (0·1 to 0·25 c.cm. every day or two days), though they often gave the patient relief, occasionally caused disagreeable reactions and did not shorten the illness. The work of Hartmann (1932) on the adrenal cortex "general tissue hormone," and of Szent-Györgyi (1931), Schroeder (1935), and Hochwald (1935) on vitamin C led me in December, 1935, to try suprarenal cortex hormone combined with massive doses of the vitamin by intravenous route. Subcutaneous or intramuscular administration appears to be less or not at all active. The cortical hormone was Eschatin, prepared by Parke, Davis and Co., which is free from protein and contains only a negligible trace of adrenaline. The vitamin C was Cébion, Merck.

As soon as the diagnosis is established I begin intravenous injections of suprarenal cortex extract, in doses between 5 and 20 c.cm., according to the age and state of the patient, with 500–1000 mg. of vitamin C. The usual daily dose of the cortical hormone injected at a time is 10 c.cm. The two products are mixed in the same syringe, since they seem to be more active when injected together. During the same day two more doses of 500 mg. vitamin C are injected at four-hourly intervals; no oral medication is given but an ice-bag is applied to the abdomen and occasionally to the head until the temperature falls. Administration of suprarenal cortex extract and vitamin C is continued for 5–12 days, and is followed by two intravenous injections daily of 500 mg. of vitamin C alone, for at least seven days.

In 15 cases of enteric fever confirmed by the laboratory (7 typhoid, 3 paratyphoid A, 5 paratyphoid B), and 3 cases of acute *B. coli* infection which were treated in this way, the results were with one exception immediately favourable, the exception being a desperate case of typhoid in which this treatment was given as a last resort. The effect is dramatic from the first injection. The injections produce no pain, shock, or reaction. There is abundant urination and a gradual fall of temperature to normal between the third and seventh day. Symptoms disappear rapidly, except perhaps the cough, which may need an expectorant, and the patient is soon able to take the nourishment which he refused or could not keep

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down. In one case vomiting persisted after the fall of temperature, but was stopped by subcutaneous glucose saline, and in two toxic cases (one of typhoid and one of acute *B. coli* infection) glucose-saline had to be given to maintain the sodium equilibrium and avoid dehydration.

CASE RECORDS

The following six cases illustrate the method and results.

CASE 1.—A boy aged 15, a painter, first seen on Dec. 7th, 1935, in the third week of his illness. Temperature 105° F., pulse small and rapid, 135. Tongue very dry. He was prostrated, delirious at times, and complained of severe pain in the lumbar and epigastric regions. He was vomiting a greenish watery liquid and refused all nourishment. There was meteorism with tenderness all over the abdomen, particularly over the cæcum, and an enlarged spleen and liver. He was having three yellow fœtid motions a day. Urine scanty with a trace of albumin and hyaline casts. Blood culture negative. Leucocytes 4300. Widal reaction positive for *B. typhosus*, 1 in 300. Blood chemistry: non-protein nitrogen, 0·055 g. per 100 c.cm.; urea, 0·045 per cent.; chlorides, 0·4 per cent.; sugar, 0·085 per cent.; cholesterol, 0·125 per cent.; bilirubin, 0·3 unit van den Bergh.

On Dec. 10th, when his morning temperature was 105·4° F., he received 10 c.cm. of suprarenal cortex extract, with 500 mg. of vitamin C, intravenously morning and evening. Between these injections he had three of 500 mg. of vitamin C. At 8 P.M., before the second hormone injection, his temperature was 102·2° F. and he was quieter. During the night he had abundant urination, and next morning his temperature was 101·8° F. The vomiting stopped, he answered questions more easily, and his tongue was moister. On the third day his morning temperature was 100° F., and his pulse-rate 92; there was no flatulence; his spleen and liver were scarcely palpable; diuresis was abundant; he was drinking much, asked for food, and was cheerful and lively. That day he had one injection of hormone and vitamin C, and two of vitamin C alone. On the fourth day his morning temperature was 98·2° F., his pulse-rate was 78, and he received me sitting up in bed. He had the same injections as the day before. On the fifth day, to my great amazement, his father brought him to my office to have his injection, so as not to disturb me. He said he was cured, and had to go to work the next day. After I had given him some pennies he agreed to be quiet for two more days. On the seventh day he refused any more injections as he felt quite well. This attitude did not surprise me for natives of his category do not seek treatment unless they are really in need of it.

CASE 2.—The son of a mason aged 11 years. He had been ill for about four weeks, but confined to bed for five days only. He had characteristic symptoms of typhoid of moderate severity. His temperature on July 9th, 1936, at 7 P.M. was 103·6° F.; his pulse-rate 120. Blood cultures negative, leucocytes 5700; Widal positive for paratyphoid A, 1 in 150. Blood chemistry: non-protein nitrogen, 0·40 per cent.; urea, 0·038 per cent.; chlorides, 0·5 per cent.; sugar, 0·097 per cent.; cholesterol, 0·125 per cent.; bilirubin, 0·4 unit van den Bergh. He was given 5 c.cm. of suprarenal cortex hormone with 500 mg. of vitamin C once a day and two injections daily of 500 mg. of vitamin C alone for 8 days. From the first injection the temperature began to fall and it was normal by the fifth day. Urination was again abundant. The patient lost his symptoms with striking rapidity. For seven days more he had 500 mg. of vitamin C, morning and evening. Convalescence was uneventful.

CASE 3.—In September, 1937, my wife had typhoid fever. She had hyperpyrexia and a rapid small pulse with circulatory depression; she was semi-conscious and delirious, with vomiting, cough, profound asthenia, acute lumbar and epigastric pains, and cramps in the extremities. There was flatulence and moderate diarrhœa. The spleen and liver were enlarged. Urine scanty with a trace of albumin. Leucocytes 5200 with lymphocytic predominance. Blood culture positive for *B. typhosus* and *paratyphosus* B. Blood chemistry: non-protein nitrogen, 0·07 per cent.; urea, 0·065 per cent.; chlorides, 0·38 per cent.; sugar, 0·078 per cent.; cholesterol, 0·11 per cent.; bilirubin, 0·4 unit van den Bergh. Treatment was begun on the ninth day when her morning temperature was 105° F. She had 10 c.cm. of suprarenal cortex extract with 500 mg. of vitamin C and two injections of 500 mg. of vitamin C daily for ten days followed by vitamin C alone for a further ten days. The typhoid symptoms regressed rapidly. The temperature fell to normal by the fifteenth day of her illness.

CASE 4.—A girl, aged 20, whom, in October, 1937, I saw in consultation, suffering from a relapse of typhoid. She was in her third month of illness with a high temperature. Her condition was very serious and she still had a positive blood culture. She had signs of damage to her right kidney and gall-bladder and a suspected myocardial involvement. After some opposition I gave 10 c.cm. of suprarenal cortex extract with 500 mg. of vitamin C once a day, and two injections daily of 500 mg. each of vitamin C. The effect was dramatic from the first injection, and on the fourth day the temperature fell to normal with abundant urination and regression of almost all the typhoid phenomena. Her rapid recovery caused a considerable sensation in Alexandria.

CASE 5.—An Italian electrician, aged 21, with typhoid. I saw him in consultation when he was in a desperate condition, unconscious, delirious, with an irregular and at times imperceptible pulse of 160, twenty or more fœtid motions a day, and intestinal hæmorrhage. The first injection of 10 c.cm. of the hormone with vitamin C seemed to relieve him. He had three injections only, for the supply of eschatin gave out, and he died three days after the last injection.

CASE 6.—A very obese woman of 70, who had had thirteen children. She had a staghorn calculus in the pelvis of her right kidney with occasional attacks of pyelonephritis accompanied by pyrexia. The urine, loaded with pus, contained colon bacilli. She always refused to hear of surgical intervention. After eight days of pyrexia ranging between 98·6° F. and 100·4° F., she had a severe rigor and her temperature rose to 104° F., with a very rapid and irregular pulse and vomiting. There was pronounced flatulence and her abdomen was tender everywhere. She was exceedingly prostrated and for the next three days vomited continually, with severe epigastric and lumbar pains and headache, several rigors a day with hyperpyrexia and profuse perspiration. The right kidney was enormous, with pain and tenderness in both loins, particularly the right. She also had oliguria, passing 300–400 c.cm. of urine in 24 hours, with albumin, pus, blood, and epithelial and granular casts. Blood chemistry between Oct. 13th and 17th: non-protein nitrogen, 0·072–0·095 per cent.; urea, 0·08–0·12 per cent.; chlorides, 0·25–0·35 per cent.; sugar, 0·07–0·085 per cent.; cholesterol 0·100–0·115 per cent.; bilirubin, 0·4–0·5 unit van den Bergh.

On the fourth day after her first rigor when she was semi-comatose she was given 10 c.cm. of suprarenal cortex extract with 1000 mg. of vitamin C intravenously followed by two injections of 500 mg. of vitamin C. This treatment was continued for eight days and was followed by two injections daily of 500 mg. vitamin C for ten days. A spectacular result was obtained from the first day, and within three days the patient had no more rigors and the temperature fell to normal. There was abundance of urine with great discharge of pus, but she continued to vomit, until she was given hypodermic glucose-saline. The affected kidney gradually grew smaller and the patient made an excellent recovery. Her urine is now clearer than it has been for years, though it still contains 0·015 per cent. of albumin and pus..

DISCUSSION

Experimental and pathological observations prove that the endocrine system, particularly the adrenals, has a defensive rôle in infection. For example, Calderera (1935), using suspensions of staphylococci and *B. coli*, found that the bactericidal power of the blood of rabbits was constantly increased by supra-

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renal cortex extract. On the other hand, Herbrand (1935) found the combined use of suprarenal cortex extract and vitamin C efficacious in protecting guinea-pigs from diphtheria toxin, while Jusatz (1936) demonstrated that the bactericidal index and antibody formation were raised by intravenous administration of vitamin C. In typhoid the combined use of suprarenal cortex extract and vitamin C intravenously, in the way suggested, appear to affect favourably, not only the deficient adrenals in particular, but also the whole system, as was demonstrated by the rapid recovery of the cases so treated. How these changes take place remains a mystery.

SUMMARY

Fifteen cases of enteric fever (7 typhoid, 8 paratyphoid) have been treated by intravenous injections of suprarenal cortex extract and vitamin C. In all but one case immediate improvement followed without untoward reactions.

In three cases of acute *B. coli* infection a similar good response was obtained.

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Alexandria, Egypt.

Clinical and Laboratory Notes

HEMIPLEGIA IN DIPHTHERIA

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It is now generally accepted that the hemiplegia complicating diphtheria may be of embolic or thrombotic origin.

Kennedy (1937) in his interesting case report says that cerebral embolism is, according to authoritative opinion, secondary to endocarditis. It is doubtful whether there is ever endocarditis in diphtheria, and the following case is described as showing a more likely cause of the embolism.

On Nov. 12th, 1936, a boy aged 10½ was admitted with diphtheria to the Hull City Hospital, Cottingham, on the fifth day of disease. There was necrotic membrane on the posterior pharyngeal wall covering both tonsils and extending beyond the pillars of the fauces on to the uvula and soft palate, with gross cervical adenitis and peri-adenitis producing the appearance of typical bull-neck. The child was already suffering from grave toxæmia and crops of petechiæ of less than 0·5 mm. diameter were apparent in the right axilla, over both clavicles and the sides of the neck. A dose of 20,000 units of diphtheria antitoxin was given intramuscularly, followed half an hour later by 20,000 units intravenously.

Heart.—During the following week there was progressive deterioration of the myocardium. The quality of the first sound in the mitral area became gradually weaker until its enfeebled sound presented striking contrast to the loud second sound in the mitral area. There was also some slight associated interference with the bundle of His as evidenced by a gradual slowing of the cardiac rate to 65 on the 13th day of disease and its slow return to 100 five days later. On the 17th day there was appreciable reduplication of the second sound in the mitral area, which persisted for three days. By the 30th day the apex-beat was ¼ in. outside the nipple line with 8 extrasystoles per 100 pulse-beats, and it was not until after the 7th week that the heart returned to its normal size and became completely regular, with much improved tone in the quality of the first mitral sound.

Proteinuria was present from the 6th to the 41st day of the disease.

Nervous system.—Palatal paresis became evident on the 11th day and pharyngeal paresis on the 38th day. On the 22nd day there was right facial weakness with inability to contract the right occipito-frontalis and orbicularis palpebrarum muscles, due presumably to a nuclear or infranuclear lesion of the right seventh cranial nerve. The knee- and ankle-jerks were also absent at this stage. There was also slight ptosis of the right eyelid, but the other extrinsic and intrinsic ocular muscles were normal. On the 24th day simultaneous weakness of the left side of the face, the left arm, and left leg was first noticed with extensor plantar response on that side. The clinical picture was that of a left hemiplegia, associated with a peripheral neuritis of purely motor type. At this stage the apex-beat was still ¼ in. outside the nipple line, with enfeebled mitral first sound and 5–8 extrasystoles per 100 pulse-beats. Slight spontaneous movements of the left leg were first noticed 8 weeks after the onset and thereafter the patient continued to make normal satisfactory progress.

Result.—He was discharged 6 months after the onset, having been up and about for 2 months. The facial weakness of both sides had completely recovered. He walked steadily without aid but swung his left leg. There was still some residual loss of motor power in the left arm and leg with appreciable spasticity and extensor plantar response on that side. The reflexes on the left side were now exaggerated. There were no deformities. A blood sedimentation-rate taken before discharge was 8 mm. at the end of an hour.

The case is interesting in that the hemiplegia was on the left side, whereas in the majority of previous reports it has been on the right. Moreover, the hemiplegia in this patient was maximal from the onset, suggesting an embolic phenomenon. It occurred at a stage of the disease when the heart was dilated and exhibited extrasystoles. Did the enfeebled heart's action together with a dilated myocardium permit the formation of a thrombus, and was this thrombus, with the onset of extrasystoles, released into the systemic circulation to form an embolus in the lenticular-striate branch of the right middle cerebral artery?

I am grateful to Dr. H. Mason-Leete for his permission to publish this case.

Reference.—Kennedy, M. (1937) *Lancet*, **2**, 851.

OVERCOMING RESISTANCE IN ABDOMINAL PALPATION

By N. J. Nicholson, M.B., F.R.C.S. Edin.

MEDICAL SUPERINTENDENT OF THE COUNTY INFIRMARY, LOUTH

Everyone is aware of the value of rigidity of the abdominal muscles as a diagnostic sign in peritoneal irritation. Beginners sometimes have difficulty in distinguishing between voluntary and true reflex rigidity. Many factors may operate to cause a patient under examination voluntarily to contract the muscles of the abdominal wall. It is often difficult to make the patient understand that he is required to relax. In many cases the request to do so draws his attention to the abdominal wall and has a result opposite to that desired. Much can be done by

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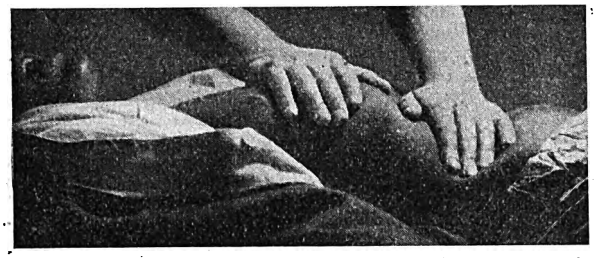
speaking to the patient about something unconnected with his illness, such as his work or family, and by asking him to breathe through his mouth. It is better for the hands to be by the sides and not behind the head. Patients think they are being helpful if they retract the abdominal wall, by bringing it closer to the vertebral column—again in contrast to



Method of palpation. The right hand restricts thoracic respiration, compelling the abdominal muscles to relax during inspiration.

the effect desired. There are many other factors that make the muscles stiff, such as nervousness, fear or modesty, cold draughts, examiner's hands cold, fear of passing flatus. Malingerers may contract their abdominal muscles voluntarily; sustained pressure will tire out the resistance and the malingerer will snatch the wrists of the examiner and protest pain.

Much is made in text-books and clinics of telling the patient to flex his hips, which is supposed to relax the abdominal muscles. If the legs are made comfortable over a pillow the plan may be successful. But too often one sees the pillow omitted, and the hips are flexed partly by the muscles attached to the pelvis. For these muscles to act the pelvis must be steadied by antagonists, notably the rectus abdominis. In other words the abdomen is stiffened and the effect again opposite to what is desired.

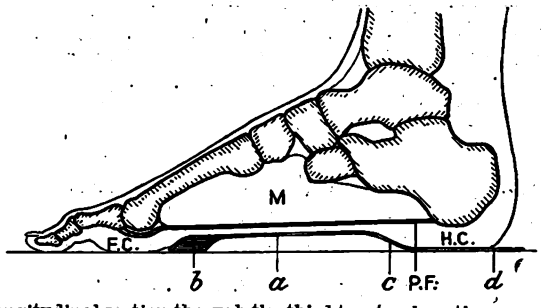
I have found a simple manœuvre useful in overcoming this resistance. When the abdominal wall is stiffened and retracted respiration becomes of the thoracic type. To counteract this the palm of one hand is rested with a fair amount of weight on the patient's sternum. This militates against thoracic respiration and encourages the patient to breathe abdominally. As soon as he does this the anterior abdominal muscles relax on inspiration and an opinion may then be formed whether the rigidity of the abdominal muscles is genuine or assumed. It is necessary for the examiner to be at some height above the patient. The height of the ordinary bed is satisfactory but the procedure is difficult if the patient is on a high trolley. The Figure (for which I am indebted to Mr. A. E. C. Todd, radiographer to the Birkenhead Municipal Hospital) may serve to illustrate the method of examination.

A NEW TYPE OF FLAT-FOOT SUPPORT

By Walter Wisbrun, M.D.
Düsseldorf, Germany

In the first stage of flat-foot, in which only a certain lengthening of the musculature has taken place, massage, gymnastics, and walking bare-footed on grassy or sandy soil are the most useful remedies. At a more advanced stage, however, when there has been a pathological alteration of the musculature, ligaments, and even bones, this treatment is no longer sufficient and further exercise may even result in further strain. Correction can then be applied only by relieving the excessive strain or by providing additional support. The old method of supplying this support consisted in the use of a plantar arch. The pressure exerted by such an apparatus is essentially at its apex and it is usually designed to exert the maximum pressure medially and to invert the foot. Not only is this inversion of no use, but the localised pressure tends to compress the all-important medial musculature of the sole of the foot.

The correct direction of support should be diametrically opposed to that of the strain—that is to say, vertically upwards. Further, the tendency to local pressure at one point, with subsequent compression and atrophy, can only be avoided by using a support modelled to the shape of the sole and this shape, as is well known, differs considerably from that of the bony arch. It will be evident from the Figure that the soft tissues of the foot, which have tended to be ignored in the past, take up considerable space. An adequate support should be adapted to both fat cushions and to the middle portion of the plantar fascia. The support illustrated is modelled to the foot and kept in position by a flat rear end (*d*), which fits into the heel of the shoe. This appliance, by means of its large supporting plane, helps to restore the pulling and pushing powers



Longitudinal section through the third toe to show the support in place. M = Plantar musculature. P.F. = Plantar fascia. H.C. = Heel cushion. F.C. = Forefoot cushion. *abcd* = support.

inherent in the different parts of the soft tissues. It is a foot brace rather than a foot support. There is no adaptation to the inner hollow of the foot, for this would cause compression of the medial portion of the plantar musculature and inversion of the foot, when eversion is needed. The raised plane of the foot brace should stop as a bar (*b*) corresponding to the straight posterior border of the metatarsal fat cushion.

I have used such a brace in a large series of cases and its efficacy can easily be demonstrated by radiography. The usual metal support is heavy, corrodes easily, and tends to damage the shoe and sock, while the brace consists of a spring made of shaped layers of ply wood, covered with leather. It is as durable as metal but much lighter and no more bulky and is easy to adapt to individual requirements.

The support is manufactured by Perpede's of Stuttgart and is obtainable from Woodway Foot Appliances Ltd., 126, Uxbridge-road, London, W.12.

International Union against Tuberculosis.—The Italian Fascist National Federation against Tuberculosis has placed at the disposal of the Union six scholarships, each of 2000 liras with board and lodging, at the Carlo Forlanini Institute in Rome. The scholarships will preferably be awarded to young doctors already familiar with tuberculosis problems. Applications should reach the secretariat of the Union, 66, Boulevard, St.-Michel, Paris, by July 1st.

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MEDICAL SOCIETIES

MEDICAL SOCIETY OF LONDON

AT a meeting of this society held on March 28th, with Mr. J. E. H. ROBERTS, the president, in the chair, a discussion on the diagnosis and treatment of

Lung Abscess

was opened by Dr. JAMES MAXWELL. He explained some of the grave fallacies which vitiated animal experimentation, and said that lung abscess could be produced by aspiration of infected material, or by the carriage of organisms to the lung in the blood stream. Blood entered the bronchial tree during most operations for tonsillectomy, and there was therefore every reason why the patient should develop a lung abscess. Few patients, however, did so, and the reason was probably that abscess formation depended upon the abolition of the cough reflex. Pneumonitis was an inflammatory consolidation of any kind, and the fate of the patient rested not only on the local but also on the general resistance. Good local and general resistance might allow a simple inflammation which would soon resolve. Good general and bad local resistance would bring about suppuration, cavity formation, and lung abscess. Good local and bad general resistance would lead to acute toxæmia which, with consolidation of the lung, was lobar pneumonia. If both forms of resistance were weak, acute septicæmia would develop. The virulence of the organism was, of course, a major factor. He was coming to look on pneumonitis as the precursor of most inflammatory lung troubles. Any condition which caused infection of the lung would cause lung abscess if the resistance of the lung tissue did not suffice to overcome the infection. Among the causes of lung abscess were lesions which concerned the respiratory tract—e.g., infection after tonsillectomy; foreign body in a bronchus; carcinoma; and pneumonia when the patient began to overcome the general toxæmia but the local resistance broke down. Lung abscess might follow chest injury or abdominal operation, especially a septic one: presumably the portal circulation became infected from a suppurative focus in the liver. When abscess followed pyæmia there was no doubt about the embolic nature of the condition. Dr. Maxwell considered that the so-called primary lung abscess was a pneumonitis in which the local resistance was breaking down.

The symptoms largely depended on the situation of the abscess. Cough was a fairly common early symptom and might result from irritation of the bronchi and therefore be unproductive. There was often surrounding congestion at this stage, and therefore hæmoptysis. Sputum might appear suddenly and in considerable quantity, signalising the rupture of the abscess into the bronchus. Pain in the chest was valuable, for it helped to localise the abscess and to show that it was near the pleura. Shortness of breath was not a prominent symptom. The general symptoms were toxic in origin; the temperature varied greatly and not necessarily with the size of the abscess. There might, not very commonly, be anorexia or vomiting. Almost diagnostic, especially in an acute case, was cough induced by a change of position and due to emptying of a cavity. The physical signs depended entirely on the situation. If the abscess were near the hilum, surrounded by a large volume of lung, there might be no signs, but if it were situated immediately under the pleura the signs might be obvious. A physical examination of the chest had therefore comparatively little value. Of the general signs, clubbing of the fingers was perhaps common, and in chronic cases there might be hypertrophic pulmonary osteo-arthropathy, or even amyloid disease. Radiological examination, especially by tomography, was very important, and the most important sign was a small fluid level in a clear area. Bronchoscopy would not only make diagnosis more certain but would assist materially in treatment. The rules for treatment were identical with those governing the treatment of an abscess anywhere else: to aid maturation and evacuation by simple means. If this would not take place, some form of surgical attack might be necessary, such as bronchoscopic aspiration or external drainage. Elevation of the feet was only of value for an abscess in certain portions of the lower lobe. Postural treatment produced rapid healing in many cases, but should not be persisted in too long if success did not come. If the view were accepted that all lung abscesses were peripheral, in relation to the pleural portion of the lobe, then artificial pneumothorax was inappropriate, except possibly for an abscess presenting into the interlobar fissure.

Mr. R. C. BROCK declared that most cases of lung abscess were primary. There was often no obvious predisposing cause, and he was not convinced of any common association between true specific pneumonia and lung abscess. The term "pneumonitis" explained the preliminary pathology. He was impressed by the frequency of gross oral—particularly dental—and nasal sepsis. The ease with which oily substances could be introduced into the nose and thence into the alveoli might be a clue to the connexion. The most important factor in the ætiology was that to which Neuhoff had called attention—the position of the abscess in relation to the bronchial tree and the pleura. He emphasised that all lung abscesses were peripheral and that the abscess resulted from blockage of the bronchus by necrotic or infected material. A cone-shaped or cuboidal area of lung distal to the blocked bronchus became infected and broke down. The old division into central and peripheral types was not valid. The first error had come from the radiologist. Most abscesses seemed to be near the hilum, but if a lateral view were taken the abscess very often appeared to be at the periphery. It was impossible to study the lungs properly without a lateral view. By far the largest number of abscesses presented in relation to the costal surface. The abscess presenting in relation to the interlobar fissure was the only type which could be mistaken for a true central abscess.

Mr. Brock dealt in detail with the anatomy of the bronchi, the importance of which in diagnosis and treatment he emphasised, and stated that for successful postural treatment it was essential to know the true direction of bronchial drainage. Bronchoscopic aspiration was valuable but not magical, as some seemed to think. As soon as postural treatment failed to produce progressive improvement, aspiration was the next step, but he had been impressed by the infrequency with which granulation tissue could be found and removed and the affected bronchus dilated. Generally speaking, any benefit would be immediate, and use of the bronchoscope should not be continued. The surgeon was concerned either with the spontaneous evacuation of the abscess by simple means,

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or with the use of external drainage if that failed. The time for external drainage was when the clinical and radiological information showed that progress was not being made.

Dr. F. G. CHANDLER spoke of the comparative frequency of spontaneous healing. Inhalations, especially of menthol steam, were useful. Arsenic by the mouth had the greatest value, and so had sodium benzoate and novarsenobenzol intravenously. Sulphanilamide might be effective in certain cases. There existed a form of suppurative pneumonitis in which there was no cavity or fluid level, and a large area of lung was necrotic. Perhaps lobectomy or even total pneumonectomy was the method of choice, but these were severe measures. He asked how he should treat diffuse lung abscess without a definite boundary.

Mr. A. TUDOR EDWARDS said he had never seen a true pneumococcal abscess follow a true lobar pneumonia. He thought that most lung abscesses were caused by the inhalation of infective material. Oil would run freely into the bronchial tree, and so the larynx did not form an impregnable defence. Needling a lung through a normal chest wall was absolutely unjustifiable, and even when the lung was exposed needling had great dangers. He made a deliberate incision through the pleura with a knife, and would rather do so even if the pleura were adherent than pass a needle through a free pleura. If the pleura were free he would suture the wound, insert an intercostal tube into the lobe, and aspirate all the air. The abscess could be localised with great accuracy by this method. At least ten days should be allowed between the two stages of operation. Suppurative pneumonitis was not quite a pulmonary abscess, but a diffuse condition with multiple abscesses. The only effective method of treating it was by coagulation and excision with a diathermy loop.

Dr. P. H. MANSON-BAHR reminded the meeting of the possibility that a lung abscess might be caused by amœba and therefore at once curable with emetine. He mentioned one case in a woman of 73, whose only contact with the tropics had been ten days in Calcutta as a bride of 20.

The PRESIDENT spoke of the danger of being too optimistic and of keeping patients waiting for spontaneous cure so long that the inflammatory process produced irreparable change in the lobe, with chronic invalidism. Nethoff had published a series of cases in which early operation had been successful in a very high proportion. Operative drainage in an early stage was not very dangerous, and should be undertaken when postural treatment did not produce drainage. The best evidence of failure to drain was the persistence of a fluid level for a fortnight. If a tomogram showed that the bronchus leaving the abscess was in the apex of the cavity, postural drainage was likely to be of value.

Dr. W. BURTON WOOD said that the physician must devise better means of dealing with diffuse pulmonary suppuration. The introduction of Prontosil and allied remedies opened up a new field of therapy.

Dr. J. G. SCADDING confirmed that suppurations occurred after lobar pneumonia. All writers on the subject had described ring shadows indicating cavities. He had seen many cases without symptoms of pulmonary abscess clear up without particular treatment. It might form a link in a long series of conditions of which the extreme form was a frankly putrid abscess, and explain some of the discrepancies in the response of various patients to treatment.

Dr. E. R. BOLAND recalled a case in which a young man had begun to recover after a severe fit of coughing, in which he had evacuated much pus, brought on by the severe tilting of his stretcher on the way up a steep flight of stairs to an operating theatre.

Dr. MAXWELL said in reply that he had encountered a case of amœbic lung abscess in a patient who had never been out of the country nor had dysentery. Diffuse suppuration sometimes responded extraordinarily well to ultra-short wave diathermy. Where the suppuration did not resolve completely, a definite abscess might be formed which could be treated in the ordinary way.

Mr. BROCK, also in reply, stated that one problem of diffuse suppuration was the possibility of overlooking a large cavity within the "black-out." The possibility of saving the patient's life might justify the use of the needle in such a case. Lung abscesses often came to treatment too late—perhaps because of mistrust of external drainage.

SOCIETY OF RADIOTHERAPISTS
OF GREAT BRITAIN AND IRELAND

AT a meeting of this society held on March 18th, with Dr. N. S. FINZI in the chair, Dr. RALSTON PATERSON opened a discussion on Methods of

Prescribing and Measuring Dosage in Radiation Therapy

He said that the great need of present-day therapy is so to build up the conception of dosage measurement that information can be accumulated about the actual lethal dose to each particular type of tumour and the tolerance of skin and other normal tissues to similar measured doses. If a system can be used for general statements of doses, quite detached from technique, wave-length, or field size, it is of real value. Dosage must be assessed in terms of quantity, which is measured in röntgens because this measure has gained international acceptance, and the only valid statement of clinical dosage is röntgens in tissue. In the treatment of malignant disease two tissues need practical consideration—the tumour and the skin. The dosage system must allow the determination of the dose actually received at every point in the tumour, usually as a statement of the maximum and minimum doses, while computation of the dose to the skin should also be given in terms of the maximum dose received at any point in the area.

In clinical work a statement of quantity alone was inadequate. The duration of exposure had a profound influence on the effect produced and in Dr. Paterson's view dosage should always be given in relation to time. Although there were physical problems still unsolved, enough accurate information was available about energy absorbed to make it possible to measure in röntgens not only X rays but also gamma rays, but the methods differed. For X radiation the dose could be measured either directly or indirectly—Dr. Paterson on the whole preferred the indirect method. The dose at the surface of the body for the particular applicator or radiation field to be used was determined and the tumour dose was arrived at in terms of percentage depth dose, or for crossed field techniques as the sum of all the contributions received from the various fields. Radium dosage assessment was at once simpler and more complex than X ray dosage assessment because, although the effects of scatter were unimportant, the multiple radio-active foci required and the variety of points at which the dose must be measured added to

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the difficulties. The speaker, with H. M. Parker, had outlined a system of dosage for radium therapy which he thought quite useful.

He suggested that by way of contrast with the methods of X ray and radium dosage outlined, other methods might be examined, such as: (1) *Röntgens in air.* This was a measurement of the intensity of an X ray beam, which meant that it measured the output of the X ray tube, not the dose received. (2) *Erythema dose.* This had real importance at the time when physical measurements had little accuracy, and might be regarded as an experimental assay, now replaced by dosage in röntgens. (3) *Summated röntgens to skin fields.* This method of reckoning dosage was misleading, especially if multiple fields had been used. It was much more informative to give a dose received at the point being treated, for example, the cervix. (4) *Milligramme hours or millicuries destroyed.* Doses in these terms were no longer used by radiologists who now thought of doses to tumour in terms of energy absorbed, and they therefore needed no further discussion.

Finally Dr. Paterson put forward a plea for considering, when prescribing radiation treatment, first the dose to the tumour, then the dose to the skin, and only after reaching a decision on these points, the technique to be employed.

Mr. B. W. WINDEYER detailed the international recommendations recently agreed upon in Chicago and pointed out their important features. He did not think that dosage rate in terms of r per minute had much effect on the production of reactions, but he agreed that the over-all time altered the effects and expected an advantage in the form of increased skin tolerance for longer over-all time. In treatment by radium all types of radiation, including the use of radon, must be covered and he used the Paterson-Parker charts for estimating dosage, except for certain standard applicators for small lesions.

Mr. L. H. CLARK discussed the dose received from radium applicators and described his method of obtaining homogeneous radiation. He also used the Paterson-Parker charts, with modifications made necessary by the difficulty of working with radium in unsuitable containers. He measured X ray doses by the indirect method and drew attention to the fact that although charts are drawn for a beam normal at the point of entry, there is, in fact, always some degree of tilting.

Mr. T. A. GREENE spoke of the importance of the volume effect, which often made it necessary to restrict the dose delivered, and he described his method of beam direction in relation to tumour doses.

The PRESIDENT pointed out the difficulty of arriving at any decision in international discussions and emphasised the progress that had been made. In this country there was general agreement on the necessity of a statement of tumour dose.

MEDICAL SOCIETY OF INDIVIDUAL PSYCHOLOGY

AT a meeting of this society held at 11, Chandos-street, W., on March 10th, with Dr. H. C. SQUIRES in the chair, Prof. JOHN MACMURRAY read a paper on

A Philosopher's View of Modern Psychology

He began by saying that the function of the philosopher was to relate the field of the expert to the more general field in which it was included. Looking at medical science he noticed that the relation of doctor and patient, from which medical science and practice arise, was a particular type of relation between persons. It conditioned everything within the field of medicine and was itself conditioned by the nature of human relations in general. The patient is a person who is anxious about himself, who asks another person to help him. The fact that the doctor-patient relation is a relation of persons provides certain principles in itself. Just as a teacher who teaches his subject and not his pupils is a bad teacher, so a doctor who sets out to heal diseases instead of healing people will not be a good doctor. The patient as a person requiring help is the focus of all problems in medicine. If medicine treats diseases, then a classification of diseases into bodily and mental will arise in which the unity of the person is lost sight of. Physicians and psychotherapists will have different objects to treat, and the necessity of coöperation in treating a patient who is always suffering in mind, whether or not he is suffering organically, will be lost sight of. Every case which a doctor deals with arises because of the patient's anxiety about himself. His anxiety, which brings him to the doctor, is his sense that something is the matter with him. The task of the physician is to discover what is the matter. If some malfunctioning of the organism can be discovered, then it can be correlated with the anxiety of the patient about himself. If this is correct then the restoration of proper bodily functioning will remove this anxiety and bring the relation of doctor and patient to an end. But if the doctor can assure himself that there is no organic failure sufficient to account for the anxiety of the patient, what is to be done? The physician may feel inclined to say that there is nothing the matter with him. But there must be something the matter with a man who comes to a doctor when there is nothing the matter with him. The anxiety must have a cause. As it is an anxiety about himself the cause must lie in himself. If it has no observable bodily correlate the anxiety itself is a disease, and expresses the patient's sense that something is the matter with his functioning as a human being. The task of finding what is the matter and curing it is then the task of the psychotherapist.

Prof. Macmurray devoted the rest of his address to a determination of some of the general characteristics of fear as exhibited in human behaviour. He emphasised the need for distinguishing fear and its derivatives as negative motives with an inhibitory effect, from the positive motives which determine the positive life processes. He distinguished human fear from "animal" fear by the presence of anticipatory phantasy. He pointed out that in all the development of consciousness and especially in all rational reflection fear was always present. Reflection itself involved the inhibition of action. In action fear expressed itself as caution: the recognition of the possibility of mistaken behaviour and so in the distinction between right and wrong. Thus it was a mistake to maintain that fear was neurotic in itself. Nevertheless anxiety, as a pervasive fear which determined an egocentric and self-defensive attitude to life, was an expression of human malfunctioning. The rhythm of human life involved both fear to provide the motive for withdrawal into reflection and the triumph over fear to provide the return to positive activity enriched by reflection. This general diagnosis of human malfunctioning, he added, could not be complete without reference to love in relation to fear, because of the inherent mutuality or reciprocity between persons which is

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the characteristic feature of human life. The environment for any person is primarily other persons. For this reason love negated by fear is the all but universal source of neurosis. Prof. Macmurray concluded by saying that these general considerations of the wider situation which conditioned psychological medicine suggested to him that he would expect that in psychotherapeutic practice the nature of the relation established between doctor and patient would play a major part in success or failure; and also that the truth of the psychological theory held by the doctor would prove of less importance in the achievement of a cure than might at first sight be expected.

REVIEWS AND NOTICES OF BOOKS

The Basis of Tissue Evolution and Pathogenesis

By ALBERT A. GRAY, M.D., F.R.S.E., formerly Lecturer on Diseases of the Ear, Glasgow University. Glasgow: Jackson, Son and Co. 1937. Pp. 92. 7s. 6d.

Dr. Albert Gray earned a world-wide reputation by his researches into the pathology of otosclerosis. These researches were greatly helped by the ingenious method which he devised to free the internal ear from its bony capsule by permeation with paraffin wax followed by immersion in very dilute acid; in this way he obtained specimens of the labyrinth far more perfect than had previously been possible, and he utilised the method in extensive studies of the human and comparative anatomy of the ear. Thus his histological work coloured his outlook on the problems of evolution, over which he had pondered from his early days. He had intended to make known his views on these problems and to publish a small book on the subject during 1936, but he died in January of that year. He had, however, discussed this work with his younger son who has now undertaken the responsibility of its publication. The manuscript was not ready for the press, and was so written over and rearranged that it was at times difficult to render it readable; the minimum of alteration has been made, and there is much repetition which Dr. Gray would doubtless have reduced if he had lived. It is with these circumstances in mind that the work now issued must be read.

The original differentiation of the tissues must have begun in the earliest stages of the evolution of the multicellular animal by the development of an external layer of cells possessed of qualities which are resistant to injury by the surrounding medium. A tear in this layer is repaired by multiplication of the cells lining its edges because these cells are best able to live on the surface, and their daughter-cells are also better adapted to a surface existence than the daughter-cells of those of the deeper layers. In this way the various tissues gradually become specialised by a process of natural selection, those cells surviving which are most able to cope with the repeated injuries caused by change of environment, and their daughter-cells possessing this quality in increasing degree in succeeding generations until the original causative injury or stimulus is eventually no longer necessary for their production. These variations are not spontaneous but the result of altered environment, and they are not purposive but due to natural selection, although they seem to acquire a purposive character. This theory does not necessitate the view that acquired characters are transmitted; what is transmitted is the faculty for repair in a particular manner from any particular stimulus, which faculty becomes increased in succeeding generations if the same stimulus persists. As a result of injury the cells which survive reproduce actively because of the room left by the death of the other cells; the young daughter-cells are not like their parents, but are comparatively undifferentiated. The daughter-cells of epithelial and masoblastic tissues are alike rounded, mobile, and phagocytic; this plastic condition makes variation more easy. A change of environment causes injury to the cells of the tissues, and the process of repair gives the opportunity for natural selection. The power of repairing an injury when it occurs is inherently, though only potentially, present in each fertilised ovum, but is different in each one. Every ovum is then destined to repair the injury in a different way, and the animal is either more or less suited than its neighbours to resist the injury the next time it occurs. In this way those which repair the injury most satisfactorily survive, and produce offspring like themselves, but each succeeding generation will on the average repair more easily than the preceding one, and thus become adapted to its environment.

There is nothing revolutionary in these speculations. The author accepts fully the process of natural selection and will have nothing to do with Lamarkianism, the inheritance of acquired characters, or the fulfilment of purpose by some mystical vitalism. Further he accepts the implications of the results obtained by geneticists and has no quarrel with Mendelism. It would seem that his thinking has been influenced by two considerations. Mutations as a cause of evolution seem unsatisfactory because there is no evidence that the right sort—i.e., mutations productive of new forms capable of standing up to the rigorous test of a natural selection—occur with sufficient frequency. Also he feels unable to accept the occurrence of spontaneous variations as adequate to provide the raw material of evolution. Further he must reject these chance variations since it is inconceivable to him that they could ever occur in that correlated order which is essential to any advance in functional efficiency. Dr. Gray's hypothesis was formulated to meet these deficiencies in the existing theories of evolution. Its obvious merit is that it does translate into actual terms of cells and tissues the reaction of the organism to changes in environment, and the author clearly apprehends that the environmental change might be described as an injury or a stimulus. At any rate, here lies the real issue. Injury in its ordinary sense—and the author uses it in the sense of pathology to include bacterial, mechanical, and other kinds of injury—is a difficult term to which to attach any meaning when one is considering (say) the origins of sexual differentiation, or for that matter any anatomical adaptation at all. Still, the author accepts this challenge and applies his theory of injury to the transformation of a limbless fish into a limbed amphibian. The very hypothetical story of the origin of the limbs in the tetrapod from the pectoral and pelvic paired fins in fishes has been recounted again and again in text-books of vertebrate morphology. To retell the story in terms of tissue injury and cell survival, to imagine the cells of a fish reacting to increasing degrees of desiccation supplies no reason why the response should have taken the form of complicated and highly organised limbs adapted for terrestrial progression.

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Operative Gynecology

Fifth edition. By HARRY STURGEON CROSSEN, M.D., Professor Emeritus of Clinical Gynecology, Washington University School of Medicine; and ROBERT JAMES CROSSEN, M.D., Assistant Professor of Clinical Gynecology and Obstetrics, Washington University School of Medicine. London: Henry Kimpton. 1938. Pp. 1076. 52*s*. 6*d*.

IT is seven years since the publication of the last edition of this well-known work. The new edition shows evidence of careful revision in the light of recent research, and more than 200 new illustrations have been incorporated. The authors include in their survey of pelvic surgery all operations on the intestine and relevant renal procedures, as well as the surgery of the female genital tract. These inclusions tend to make it a rather bulky volume. The information given is interesting, useful, and well arranged. Reference is constantly made to historical sources and to modern work of accepted standard. The authors are advocates of radium therapy in all stages of carcinoma of the cervix uteri. There seems some lack of balance in allocating the same amount of space to the surgery of uterine retroversion as to that of prolapse, and also in dismissing the subject of myomectomy in a few pages.

1937 Year Book of Obstetrics and Gynecology

Obstetrics. Edited by JOSEPH B. DELEE, A.M., M.D., Professor of Obstetrics, University of Chicago Medical School. *Gynecology*. Edited by J. P. GREENHILL, B.S., M.D., F.A.C.S., Professor of Obstetrics and Gynecology, Loyola University Medical School. Chicago: The Year Book Publishers; London: H. K. Lewis and Co. 1938. Pp. 704. 10*s*. 6*d*.

THE new edition of this year book follows its customary plan. A large range of subjects is reviewed in the précis of the year's publications, with editorial comment. The summaries make interesting reading and as they are grouped according to the subject discussed, the diversity of opinion on any one of them can be perceived at a glance and evaluated at leisure. This year prominence has been given to the use of drugs in labour and their dangers. Of special interest are the sections on the physiology of the new-born, the operative treatment of complete perineal rupture, and the summary of the vast literature on endocrinology.

The Mind of Man

By WALTER BROMBERG, M.D. London: Hamish Hamilton. 1937. Pp. 323. 10*s*. 6*d*.

THE promise of the subtitle, The Story of Man's Conquest of Mental Illness, is borne out by the text of this work; the author is an enthusiast whose zeal leads him into over-emphasis. The book centres round three topics—demonology, faith-healing, and psycho-analysis; the first and last of these are treated in as much detail as if they had been written for an elementary text-book. Historical and psychiatric proportion is lost by such treatment; thus Wagner Jauregg's great discovery receives barely five lines, and psycho-analysis more than two thousand, but no doubt the layman, for whom the book is largely intended, will find it none the less engrossing. The writing is fairly restrained and inoffensive, and, although one might dispute some of Dr. Bromberg's statements (e.g., he follows Zilboorg in giving excessive importance to Weyer, yet he says nothing of Plater or, in an earlier age, of Gerson) there are few gross errors of fact except where the author's bias has been too strong for him: thus it is quite incorrect to say (p. 233) that by 1920—or by 1938, for that matter—most of the psychiatrists of Europe and America had accepted psycho-analysis as a method of investigation of infinite value for psychiatry and as a technique of treatment capable of "eradicating the roots" of neurosis. It is, however, the omissions in the book that are most important; because of them it has no claim to be taken as a serious history of psychiatry or psychotherapy.

Emergency Surgery

Third edition. By HAMILTON BAILEY, F.R.C.S., Surgeon, Royal Northern Hospital, London; Surgeon and Urologist, Essex County Council. Bristol: John Wright and Sons. 1938. Pp. 852. 50*s*.

THIS book must be one of the most widely read practical surgery books in the English language. Three editions have been called for since 1930 and each has been extensively revised, the last more than any. An experienced emergency surgeon reading this book might well find that in many conditions his own procedure differs from that recommended. But he would admit that all the methods described are effective and practical and that all occupy an established place in surgery. There is indeed an extraordinary amount of useful knowledge collected together here. The junior surgeon could scarcely have a better guide. Mr. Hamilton Bailey has done a service to the profession and to the public in collecting in such an attractive form instructions for dealing with almost any surgical emergency that may arise.

Drugs and Galenicals

Their Quantitative Analysis. By D. C. GARRATT, B.Sc., Ph.D. Lond., F.I.C., Drug Analyst, London County Council. London: Chapman and Hall. 1937. Pp. 422. 25*s*.

THIS book deals solely with the quantitative analysis of drugs. It reflects the author's wide personal experience in the London County Council's analytical laboratories and contains much original material. Existing methods are critically discussed, and the analyst may confidently adopt those here recommended which are described in detail. The determination of small quantities of poisons is discussed in several of the monographs; the book will be of great use to the toxicologist. The section on the essential oils is a model of accurate condensation. Adequate references to original papers are given at the end of each section and the index is full and reliable.

Clinical Urinalysis and its Interpretation

By ROBERT A. KILDUFFE, A.M., M.D., F.A.S.C.P., Director of Laboratories, Atlantic City Hospital. Philadelphia: F. A. Davis Company. 1937. Pp. 428. $4·00.

THIS book covers the clinical and simple laboratory analysis of urine, the interpretation of analytical results, and certain tests of function involving estimations of urinary constituents. Chapters are allotted to abnormal constituents (including drugs), bacteria and parasitic organisms, urinary sediments and calculi, pregnancy tests, and life insurance procedure. There are no important omissions. The chemical tests given are mainly modern and well-tried procedures and are simply described. The author would have done better to avoid explanations of

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certain physical and chemical terms rather than to supply inaccurate notes on them; as for instance in the accounts of *p*H (p. 63) and of some of the renal function tests (e.g., p. 295). We have detected a few errors, for example, salicylates are said to give a positive Rothera test (p. 113), but as a whole the book is carefully written. The point of view throughout is that of the clinician and practitioner with few laboratory facilities, but it will be useful also to those others whose duty it is to try to supply the answers to questions posed by those in charge of sick people.

Sterols and Related Compounds

By Prof. E. FRIEDMANN, M.D., Ph.D. Cambridge: W. Heffer and Sons. 1937. Pp. 100. 7*s*. 6*d*.

THIS book is based on three lectures given at the Sir William Dunn institute of biochemistry at Cambridge; the first on sterols, bile acids, heart poisons, and saponins, the second on vitamin D, and the third on sex hormones and carcinogenic substances. Prof. Friedmann provides a lucid, connected account summarising our present knowledge of these groups of substances rather more from the chemical than from the physiological viewpoint. The book is well furnished with chemical formulæ, and contains a number of references in the text. The author takes a balanced view, considering carefully all the available evidence, of the relation between carcinogenic compounds and the sterols. It is a pity that he omits all mention of the synthetic œstrogenic compounds. In a foreword Sir F. Gowland Hopkins says that "the book contains no single redundant sentence, nor one unnecessary word," and we agree that it is admirably succinct. In one place only the words should be rearranged, where Prof. Friedmann, speaking of "the blood content of free phosphate" probably does not mean to suggest that he is capable of getting blood out of a stone.

Applied Laboratory Technique

Second edition. By JOHN A. KOLMER, M.D., F.A.C.P., Professor of Medicine, Temple University, Philadelphia; and FRED BOERNER, V.M.D., Assistant Professor of Bacteriology, School of Medicine, University of Pennsylvania. London: D. Appleton-Century Co. 1938. Pp. 893. 30*s*.

IN 1931 Kolmer and Boerner, with the assistance of a special committee of the American Association of Clinical Pathologists, for the first time brought together in one volume all the laboratory methods in general use as aids to clinical medicine. The techniques selected for description were those that had been thoroughly tried and found reliable and satisfactory throughout the world. Their book presenting as it did the experience of a large sodality of workers has proved of immense value to all engaged in clinical laboratory practice, and has done much to bring about a standardisation of clinical laboratory methods. It still remains a monument to the labours of its authors and to the vision and foresight of the executive of the American Association of Clinical Pathologists, and though now seven years old it is hardly out of date. That is not to say that a new edition incorporating improvements in technique and new work will not be welcomed. Every chapter has been thoroughly revised; a few methods have been dropped and many new ones included. Five additional chapters have been added; of these those on the hormonal diagnosis of pregnancy, chorionepithelioma, hydatiform mole, and teratoma testis, and on the laboratory diagnosis of mycotic infections are particularly valuable. The latter contains much matter hitherto not available in any single work of reference.

British Journal of Children's Diseases

IN the January-March issue Dr. F. R. B. Atkinson contributes an exhaustive paper on Gaucher's Disease in Children based on a study of 108 published cases. There are tables devoted to the blood, chemistry of the spleen and details of the recorded cases, and a bibliography of 86 references.—In their article on the Anomalous Forms of Varicella Dr. G. W. Ronaldson and Dr. W. Howlett Kelleher record 8 personal cases illustrating prodromal scarlatiniform rashes, attenuated forms of the disease in which the modification was natural or the result of the intra- or per-cutaneous introduction of lymph from a recent chicken-pox vesicle, varicella bullosa, varicella gangrænosa, varicella hæmorrhagica, and varicella herpetiformis.—Mr. A. Ralph Thompson's paper on the Clinical Anatomy of Cases of Epispadias and Extroversion of the Bladder is based on 9 personal cases of epispadias and 23 of extroversion of the bladder. The following classification is adopted: (1) Epispadias (*a*) in males, (*b*) in females. (2) Extroversion of the bladder with full development of the genitals and scrotum. (3) Extroversion of the bladder with incomplete development of the scrotum and the testicles not fully descended. (4) Extroversion of the bladder with bifid penis and scrotum. (5) Extroversion of the bladder with bifid penis and scrotum, and the formation of a proximal urethra which is capable of controlling the act of micturition, if steps are taken to ensure this. (6) Extroversion of the bladder with intestinal connexion, and the formation of a normal urethra. (7) Extroversion of the bladder in females.

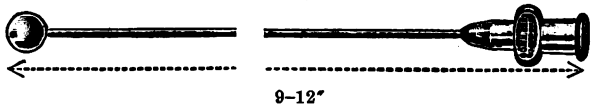
The abstracts from current literature are devoted to treatment.

NEW INVENTIONS

A NEEDLE FOR VARICOSE VEINS AND EMBOLECTOMY

THE use of a long ball-ended needle for the treatment of extensive varicose veins was described three months ago (Stevenson and Walker 1938). The instrument has also been found of service in facilitating the removal of an embolus from the main artery of the upper limb (Stevenson 1938).

The needle, which is made by Messrs. Down Bros., Limited, London, is 9–12 in. long and fits a standard glass syringe. The ball through which the end of the needle passes is a little over ¼ in. in diameter.



A small transverse incision is sufficient for the purpose of admitting the head of the needle and withdrawing the clot. It is suggested that this incision, when sewn up, causes less constriction of the vessel than the longitudinal one. The smooth surface of the ball, which is smeared with vaseline before use, does not in any way damage the delicate intima. Strong suction may be applied within the vessel without its walls blocking the lumen of the needle.

References.—Stevenson, D. L., and Walker, R. M. (1938) *Lancet*, Jan. 1st, p. 27. Stevenson (1938) *Ibid*, March 26th, p. 723.

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THE LANCET

LONDON: SATURDAY, APRIL 2, 1938

CONTROL OF THE COMMON FEVERS

UNDER this heading we publish to-day the first of a series of articles on the preventive treatment of infections. No attempt will be made to press these articles into a common mould. The growing point of our knowledge is sometimes on the epidemiological side, sometimes in the pathological laboratory, and sometimes in clinical practice at schools and institutions. Scarlet fever, for instance, although it is a clinical entity, is not, like diphtheria and enteric fever, an epidemiological entity. The chief interest in diphtheria lies in the possibility of eradicating the disease by means of immunisation, whereas in measles it centres round the substitution of mild for severe attacks. Dysentery has become prevalent throughout the country almost unnoticed, and there may be ignorance of the very existence of undulant fever. The object of this series then is to present experience of the various common fevers as the problem appears at the present time. There is reason to think that this part of medicine is one in which practice lags unduly far behind knowledge; for now that typhoid and diphtheria are no longer treated in general hospitals the medical student is less familiar with them than he was, and in undergraduate days he sees little of such infections as measles and whooping-cough which are not even notifiable.

Measles, the subject of the first article, occupies a unique position among the few diseases that are fully controllable by specific means. Even the most violent opponents of "inoculation" in any form can scarcely object to the injection of human serum; it has none of the disadvantages, either sentimental or practical, of horse-serum or of immunising agents prepared from micro-organisms. Nevertheless its proper use can be as beneficent in effect as any form of specific therapy yet at our disposal. Although the serum of recent convalescents is the most effective, that of any adult who has had the disease even in distant childhood contains the protective antibody and will serve if given in somewhat larger amount. Given within five days of exposure to infection it will prevent the disease altogether. But this protection, like any other form of purely passive immunisation, is transitory. Given within the next two or three days, or in smaller amount at an earlier stage, it will secure a modified attack, a brief period of febrile catarrh with the characteristic rash but with little general disturbance and almost no liability to pneumonia or other complications or to subsequent ill health. This miniature version of what measles may be is nevertheless followed by permanent immunity; indeed, the serum of convalescents from such an attack is said to have a protective capacity in others equal to that of sufferers from the fully developed disease. The dose of serum necessary to secure these results varies according to its source, the age of the child to be protected, and the stage at which it is given. A syringeful of blood which anyone can spare may save a child from a dangerous and debilitating illness; a bleeding on the transfusion scale will furnish the means of protecting several dozen children.

Why is this valuable method still so little used? There are perhaps three reasons for this, of which the first is that the whole of the medical profession is not yet so conversant with it as to create a full demand for it or to ensure its right application. The second is the frequent difficulty of ascertaining the date of exposure to infection and thus calculating with certainty the dose of serum and the time of its administration to secure the desired result. As Dr. GUNN points out, a legitimate—perhaps an ideal—way of overcoming this difficulty is deliberately to expose children to infection; the old-fashioned "measles tea-party," originally aimed at getting all the attacks in the family over simultaneously, can now be revived with a better object. But a difficulty more serious than either of these is that of obtaining serum. A few hospitals and local health authorities maintain supplies, of which some are available for private practitioners, but usually the supply is limited, and the serum is only provided for infants, in whom it is advisable to prevent an attack altogether. The only product available commercially is a placental extract which is undoubtedly an efficient prophylactic but may cause unpleasant reactions. Whose business should it be to make good this defect? It certainly appears to be within the province of local health authorities, and at the same time there seems to be no very obvious reason why supply should not be undertaken by commercial houses. Many people would be willing to give blood both for a useful cause and for the substantial payment which would be made possible by a moderate selling price. It is clearly necessary that some responsible body should move in this matter in order that one of the most valuable of all remedies in medicine may become more generally available.

SHORT WIRELESS WAVES IN EXPERIMENTAL CANCER THERAPY

THE use of electromagnetic waves in order to subject cancer to heat therapy as distinct from surgical diathermy was advocated sporadically by various workers in the days when only the long-wave diathermy was available. The principal objection to the procedure was the danger of burns, but difficulties in application by means of direct contact through saline pads were also considerable. RHODENBURG and PRIME [1] and WESTERMARK,[2] however, achieved some measure of success in the treatment of animal tumours, and the

[1] Rhodenburg, G. L., and Prime, F., *Arch. Surg., Chicago*, 1921, 2, 116.
[2] Westermark, N., *Skand. Arch. Physiol.* 1927, 52, 55.

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former workers made the interesting, but not yet fully confirmed, observation that the combination of relatively small doses of diathermy with X ray treatment gave results better than either alone. With the introduction of "short" wireless waves (15–50 m.) and later on "ultra-short" waves (below 15 m.) new possibilities were opened up, for not only could these waves be applied by means of insulated electrodes, without metallic contact, but their method of passage through the tissues was shown to differ from the purely conductive transport of the longer waves. Thus more even penetration can be secured, and at the same time the danger of burning is far less, since with a lower applied high-frequency voltage shorter waves will produce the same degree of heating. The pioneer work on the action of ultra-short waves on experimental tumours was done by SCHERESCHEWSKY [3] in U.S.A. and by PFLOMM [4] in Germany. Both workers obtained regression of transplanted tumour by local application of ultra-short waves, but their results were not quite clear-cut. PFLOMM used a strain of rats in which the Jensen sarcoma grew poorly, and the tumours grew again after a partial regression; while in SCHERESCHEWSKY'S work it seemed, at any rate in the earlier experiments, that the action was not due to heat. This impression was based on the fact that after treatment the tumours did not feel warm, but later more accurate measurements [5] convinced SCHERESCHEWSKY that the cures observed were in fact due to heat. In the meantime however, REITER,[6] working in Siemens's laboratory in Germany, had vigorously championed the so-called specific action of these waves. Not only did he claim that heat was not responsible but also that an extremely critical wave-length was needed to bring about regression of animal tumours. Work of TAYLOR [7] shed doubt on the accuracy of these observations, and as a result of very thorough investigations by DICKENS, EVANS, and WEIL-MALHERBE [8 9] it was finally shown that the effects observed by REITER were due entirely to the heat generated in the tissues by ultra-short waves, and were independent of the particular wave-length used. Two years ago the whole position with regard to "specific actions" was reviewed by CURTIS, DICKENS, and EVANS,[10] who came to the conclusion that no definite case for specific action has been made out, and that the onus of proof rests with those who claim that these effects exist.

It seems, therefore, that we may accept the action of these waves as a heat action. The possibility of their application to human cancer is still uncertain, for in the more reliable animal experiments reported the rise of temperature needed to secure regression of the tumours was considerable. The period of application in these experiments was, however, short; and in dealing with human cancer it may be necessary to apply less drastic treatment over a longer period. This could be done either by local application, using short-wave diathermy, or by general hyperthermia induced either by short waves or by radiant heat. So far, the only serious attempts reported at treating human cancer by this method are those of WARREN,[11] who maintained a number of patients suffering from cancer deemed incurable at 41·5° C. (rectal temp.) for periods up to 24 hours. Although in no case was anything approaching a cure achieved, the hyperthermia seemed to have a definite destructive effect upon the tumour cells. According to RHODENBURG,[12] who has studied spontaneous regressions accompanying clinical fevers in cancer cases, an important feature may be the maintenance of temperatures of 104°–105° F. for a period of 48–96 hours. Even on the assumption that the observed regressions were due solely to the temperature, it must be emphasised that no thermal treatment sufficiently prolonged and intense to be effective has been tested; and that any such attempt should be left to those who realise the danger and discomfort that such applications may bring in their train if they are sufficiently prolonged and thorough to have any chance of success. In local treatment the possibility of using temperatures somewhat higher than could be tolerated in general hyperthermia renders the outlook perhaps a little more hopeful.

Extensive investigations on laboratory and clinical lines are being made at the North of England branch of the British Empire Cancer Campaign. There is now no reason to believe that the effects of certain wave-lengths are specific, and the wave-length to be used is largely determined by convenience in application. Thus for general hyperthermia, or for local hyperthermia by means of the inductotherm (coil heating), waves above 15 m. will usually be most suitable, while for local heating by means of electrodes the ultra-short waveband offers the advantage of greater heat production for lower voltage, and consequently less danger of burning. For practical purposes, 3 m. may be taken as the lower limit of usefulness of these waves, owing to the loss of efficiency in generating and transferring the shorter wave-lengths. Experimentally, however, the still shorter radiations, which begin to approach the infra-red region, are of interest, although, as yet, it has only been possible to produce these in very feeble intensity. VAN EVERDINGEN [13] has very recently studied the action of waves of 60–25 cm. on mice bearing a transplantable lymphosarcoma or tar carcinoma without any great effect being observed, and he concludes that a retarding effect of these waves on malignant tumours is not very probable. But it appears doubtful if the intensity of radiation was really adequate in these experiments for the irradiation of the whole animal and it might have been more hopeful to have tried the effect of a local application.

[3] Schereschewsky, J. W., *Publ. Hlth Rep., Wash.* 1928, **43**, 927.
[4] Pflomm, E., *Münch. med. Wschr.* 1930, **77**, 1854.
[5] Schereschewsky, J. W., *Radiology*, 1933, **20**, 246.
[6] Reiter, T., *Dtsch. med. Wschr.* 1933, **59**, 160, 1497.
[7] Taylor, H. J., *Brit. J. Radiol.* 1935, **8**, 718.
[8] Dickens, F., Evans, S. F., and Weil-Malherbe, H., *Amer. J. Cancer*, 1936, **28**, 603.
[9] — — — *Ibid*, 1937, **30**, 341.
[10] Curtis, W. E., Dickens, F., and Evans, S. F., *Nature, Lond.* 1936, **138**, 63, 1100.
[11] Warren, S. L., *Amer. J. Roentgenol.* 1935, **33**, 75.
[12] Rhodenburg, *J. Cancer Res.* 1918, **3**, 193.
[13] van Everdingen, W. A. G., *Ned. T'ijdschr. Geneesk.* 1938, **82**, 284.

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INSULIN SHOCK IN PSYCHIATRY

THE records of investigations with the insulin treatment of schizophrenia increase rapidly, though many of them are repetitive rather than original in substance. Besides the primary issue—the efficacy of the treatment—subsidiary problems, for example the significance of convulsions (see p. 776), the relation of blood-sugar level to "shock," the possible modifications of the method, are now being examined. The question of priority [1] has also been brought forward, as might have been predicted. PÖTZL has himself said [2] that the method introduced by SAKEL in his clinic at Vienna was the audacious continuation of earlier work. PASCAL had published in France in 1926 her book on the treatment of psychoses by shock, including some instances of insulin shock; JULIUS SCHUSTER [3] reported from Hungary in 1928 the favourable results of treating a series of schizophrenic patients with large doses of insulin, and in the next two or three years JASCHKE, HAACK, and others pointed out the symptomatic value of insulin treatment, while STECK [4] in Lausanne pursued an independent line of attack. Several psychiatrists had been concerned with the treatment of delirium tremens [5] by fairly large doses of insulin, and it is noteworthy that SAKEL'S therapeutic procedure with schizophrenia developed out of his earlier efforts to treat drug-addiction by insulin. Why he should have taken this step, passing from morphinism to schizophrenia, is still obscure; it was either an entirely empirical venture or based upon erratic theory. This matter, and others important in the genesis of the method, are reviewed in an admirably balanced and critical article by B. SLOTOPOLSKY-DUKOR,[6] himself one of the earlier workers in the field, who provides a more informative aperçu of the background of the new treatment than any hitherto available.

SAKEL'S great claim to recognition lies in his bold forcing of the method to its furthest—Prof. PÖTZL would say its logical—conclusion. Any rivalry between SAKEL'S insulin method and MEDUNA'S cardiazol method is less a question of priority than of efficacy and independence: many writers follow M. MÜLLER in protesting that the two methods are complementary, but this hope has not been confirmed, except in isolated cases.

The fact that there are discrepancies between the dose of insulin and the blood-sugar level attained, and between the blood-sugar level and the severity of the reaction to insulin has been remarked and pondered by various workers.[7] [8] In a recent communication HEILBRUNN [9] maintains that there are always severe clinical signs when the blood-sugar content falls to 30 mg. per 100 c.cm. or lower, provided that the fall in the blood-sugar has occurred rapidly and the sugar continued at the lower level for a fairly long time. Even if this congruence between hypoglycæmia and clinical signs is established within the conditions stated, it leaves unexplained all the other cases in which the provisos are not fulfilled, as well as the cause of this rapid descent and prolonged stay at a low level of the blood-sugar. In this connexion there are also problems of idiosyncrasy, "sensitisation," and habituation on which adequate biochemical and pharmacological investigations are still to seek. Whether insulin treatment has any effect on mental conditions other than schizophrenia has not been much tested. A few workers have applied it to obsessional neurosis, usually without benefit, but two Australian physicians [10] have lately succeeded in producing excellent recovery, which they have good cause for attributing to insulin shock, in a severely obsessional patient who had hitherto been treated by psychoanalysis without benefit. Such a result, however, cannot by itself be regarded as carrying weight.

[1] *J. Amer. med. Ass.* Jan. 8th, 1938, p. 144.
[2] *Wien. klin. Wschr.* Feb. 11th, 1938, p. 181.
[3] *Arch. Psychiat. Nervenkr.* 1928, 85, 779.
[4] Comptes rendus du Congrès des aliénistes de France à Rabat, 1933, p. 441.
[5] Kemperer, E., *Mschr. Psychiat. Neurol.* 1929, 74, 116.
[6] *Schweiz. med. Wschr.* Feb. 12th, 1938, p. 148.
[7] Katzenelbogen, S., Harms, H. E., and Clark, D. A., *Arch. Neurol. Psychiat.* January, 1938, p. 1.
[8] *Schweiz. Arch. Neurol. Psychiat.* 1937, 49, Suppl.
[9] *Wien. klin. Wschr.* Jan. 28th, 1938, p. 114.

INDUSTRIAL EYE INJURIES

THE continued prevalence in various industries of serious injuries to the eye is profoundly unsatisfactory; they are mainly preventable but remain unprevented. In the annual reports of the chief inspector of factories they amount to about 4 per cent. of the total of industrial accidents, but these reports include only those accidents which have disabled workmen for more than three days. A truer picture of their frequency is given by the attendances at the Royal Eye Hospital, where some 7000 industrial injuries are treated in the year. The chief causes of these injuries naturally vary in different districts according to the predominant industries. In Southwark the engineering and metal trades are responsible for four out of five of the injuries, about half being incurred whilst grinding with emery wheels. The remainder are caused in building, coke making and transport work, and in chemical, paper and printing factories. In other parts of the country mining and quarrying may be the main sources. Corneal foreign bodies and corneal abrasions are the commonest lesions at the Royal Eye Hospital, and these come almost entirely from the metal trades. Subtarsal foreign bodies are remarkably rare, possibly because the immediate discomfort which they produce leads patients to seek advice from their own doctors before there has been much damage. The remaining cases come under the headings of intraocular foreign bodies, perforating injuries, chemical burns, injuries due to lime, concrete, and cement, and electric welding conjunctivitis.

In a recent lecture to the London industrial committee of the National Safety First Association Mr. JOSEPH MINTON put the proportion of industrial eye injuries which are preventable as 80 per cent. That they are not prevented is

[10] Farran-Ridge, C., and Reynolds, P. G., *Med. J. Aust.* Jan. 15th, 1938, p. 100.

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due partly to the non-provision of safety measures by employers, especially in the smaller firms, but more to the indifference of the workmen themselves. This lack of interest in preventive measures was commented on by the departmental committee on the causes of blindness in 1922, and at that time Sir ARNOLD LAWSON remarked that it was doubtful whether there would be much improvement until compulsion was used. An Industrial Eye Injuries Committee, the first of its kind, has now been established at the Royal Eye Hospital to coördinate the efforts of all concerned in the prevention of these injuries. The committee have arranged an exhibition of the safety appliances available for different industrial processes in the out-patient room of the hospital, where patients cannot fail to notice it. The appliances shown are of two main types: goggles, masks, veils, and eye-screens to be worn by the workmen, and screens and guards to be attached to machines. All casualty patients are now advised as to the necessary protection for their type of work and where a number of patients come from one factory the employer is written to advising him of the steps he should take. In future employers will be able to address their inquiries about suitable protective measures direct to the committee, and it is hoped that the propaganda of this body, with the help of employers, trade-unions, and insurance companies, will be successful in persuading workmen that the measures are worth taking.

ANNOTATIONS

COTTAGE HOSPITALS

THE rapid increase in the number of cottage hospitals throughout the country since the first was established at Cranleigh in 1859 is evidence of the demand for inexpensive institutional accommodation for patients who need more nursing or other attention than can be given at home and yet do not require the resources of a fully equipped hospital with a consultant staff. These small local hospitals are presumably so popular, more particularly in rural districts, partly because they are easily accessible for both the patient and his visitors and partly because the patient can there continue to be treated by his own doctor. In their report on the hospitals of Cornwall, summarised in our last issue (p. 747), Dr. Eric Donaldson and Mr. R. H. P. Orde remarked on the fact that no general agreement has ever been reached as to the precise functions of the cottage hospital. Mr. W. M. Goodenough defined [1] a cottage hospital at the Voluntary Hospitals Conference in 1934 as one in which specialists were not regularly or easily available, where there were no resident medical officers or highly specialised equipment, and where the staff consisted of local general practitioners; but it would be difficult to find any description which would apply to all. At present the functions which they purport to perform vary from little more than zero to practically those of a modern general hospital, and there is similar variation in their conditions of admission, their methods of staffing, of nursing, of administration, and so on.

In any particular town or district the range of hospital treatment possible depends primarily upon the available professional skill, accommodation, and equipment. Unless the town is large and wealthy it can neither provide an adequate living for the consultant and the specialist, nor can it find the money for the costly buildings and apparatus which he requires. Whatever hospital system is adopted, whether voluntary or State, full-range specialist services must of necessity be concentrated in centres of population. Towns of moderate size may be able to afford a well-equipped hospital of 200 beds or more, but they are not large or wealthy enough to provide professional skill of sufficient status to satisfy the requirements of the general practitioners of the district. In many cases, therefore, owing to the distance from any large hospital with a specialist staff, cottage hospitals have been thrown very much on their own resources and have come to regard themselves as self-contained units able to deal with anything that may arise without outside help or advice. This view is clearly fallacious; between the small hospital in the village and the general hospital in the big city there is an essential difference of function which cannot be disregarded without detriment to the patient.

Dr. Donaldson and Mr. Orde suggest that a cottage hospital should be defined as one with not more than 50 beds, staffed by all the general practitioners of the area, and reasonably well equipped to deal with emergencies in the neighbourhood, such as patients requiring immediate operation or those whose condition would make it unsafe for them to travel a long distance in an ambulance. It would, for instance, provide first-aid for fractures sufficient to allow them to be sent safely to a fracture clinic, and would as a rule deal with the acute medical case. They suggest also that patients operated on in a general hospital should be transferred to a cottage hospital for after-treatment under their own doctors. With modern transport facilities there should be no objection to limiting cottage hospitals to emergencies, cases too trivial for the attention of a general hospital, and those who are semi-convalescent. With effective coördination, such as might be provided by an advisory committee representing all the hospitals in the district, this degree of limitation should enhance the efficiency of existing rural services.

[1] *Lancet*, 1934, 1, 1355.

THE INHERITANCE OF BLOOD GROUPS

THE search for greater differentiation between the heritable blood characteristics of individuals is still being pursued all over the world. Dr. Dawood Matta confirms [1] the existence of the subgroups A_1 and A_2, which are now fairly generally accepted and which G. Schrader [2] believes to be demonstrable with sufficient certainty for use in legal proceedings. Unlike Schrader, Dr. Matta also accepts the subgroups B_1 and B_2. The distinction is quantitative only, and these two pairs of subgroups have a very limited application to paternity disputes. Until recently the character O was thought to consist merely in the absence of agglutinogens from the red cells, but F. Schiff [3] declared that O cells contained an agglutinogen for

[1] A Critical Investigation of the Blood Groups, and their Medico-Legal Application. 1937. Cairo: The Egyptian University; Faculty of Medicine. Publication No. 11. Pp. 231.

[2] *Med. Klinik*, Feb. 4th, 1938, p. 141.

[3] Die Blutgruppen u. ihre Anwendungsgebiete, Berlin, 1938, p. 24.

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which the agglutinin α_2 was specific. Dr. Matta confirms this observation, and also records the presence of agglutinogen O in the cells of certain AB persons. On the basis of its quantitative variation in the cells of the various subgroups, together with the distribution of the A and B agglutinogens, he formulates a new classification of 13 subgroups. The results which led to this classification cannot, he says, be fully explained by any of the current theories of blood-group heredity. He explains it himself by the hypothesis that the agglutinogen O, as well as A and B, is a Mendelian dominant and that the genotype of each individual is composed of four genes representing one, two, or three agglutinogens, two of which are transmitted from each parent to the child. He admits that he has so far tested this hypothesis only on 99 families. He agrees with V. Friedenreich's observation of a weak type of N agglutinogen. His attitude towards the application of blood-group determination to questions of disputed paternity seems unduly severe, for he suggests that it should be restricted to exclusions based on the simple Mendelian law that a child cannot possess either of the dominant agglutinogens A and B unless it was present in one of the parents. While he may well be right to avoid the dubious ground of quantitative estimation, the M and N factors have long been deemed as reliable a basis as the A and B for exclusions of paternity.

PROGRESS OF THE RÖNTGEN

"The röntgen (symbol r) shall be the quantity of X- or gamma-radiation such that the associated corpuscular emission per 0·001293 gramme of air produces, in air, ions carrying 1 electrostatic unit of quantity of electricity of either sign."

SUCCESS in the treatment of disease by any form of radiation depends essentially on the accurate measurement of the quantity delivered at the spot where any tissue is being irradiated. This was made clear enough at an important meeting of radiotherapists reported on page 782. The most satisfactory method of measuring X rays is founded on the determination of the electronic or corpuscular ionisation liberated in air by the radiation and this is the basis of the international unit of X ray quantity now adopted—the röntgen (r). The physical questions involved are complex, and to some extent controversial, but we may assume that in the case of X rays it is possible to arrive at a measurement of ionisation which approximates, in stated circumstances, to a measurement of the actual absorption of energy by the soft tissues of the body. The International Radiological Units Committee, which met during the Chicago congress last September, considered whether the use of the röntgen could now be extended not only to every class of X rays but also to gamma rays. The advantages of a common unit are obvious, both for comparing and combining X ray and gamma ray therapy, but international approval was not reached at the Zürich congress of 1934 on account of discrepancies in the physical measurements. Since that time, however, more accurate determinations have been made by Jaeger (*Phys. Zeit.*, 1934) for X rays up to 500 kv. and by Kaye and Binks (*Proc. roy. Soc.*, 1937) for gamma rays using a free-air ionisation chamber measuring 12 × 10 ft. These large-chamber measurements have provided a standard of reference for calibrating special small ionisation chambers, and important work has been done by L. H. Gray (*Brit. J. Radiol.* 1937, **10**, 600) and W. V. Mayneord (*Ibid*, p. 365) on indirect determination in terms of ionisation of the absolute increase of energy of the absorbing medium. The British X Ray and Radium Units Committee therefore found it possible to submit, through their delegates (Dr. N. S. Finzi, Prof. F. L. Hopwood, and Mr. G. W. C. Kaye, D.Sc.), a memorandum recommending the adoption of the röntgen as the only basis for both X rays and gamma rays, and the International Committee, after much discussion, decided to adopt a provisional general definition of the röntgen until the next congress, when it is hoped to submit a more exact definition, which will include all classes of ionising radiation, for example neutrons. In the meantime the various national laboratories will continue to coöperate in standardising units, technique and measuring instruments for radiotherapy.

MATERNAL AGE AND FŒTAL MALFORMATION

IN the Ingleby lectures of 1927, Still [1] drew attention to the importance of maternal age and birth order as predisposing factors in cases of congenital diseases. The subject has recently been investigated extensively in England and in the United States. An analysis of the maternal ages at the births of 607 congenitally malformed children, made by Murphy,[2] led to the conclusion that the affected child was likely to be fifth or later in the order of birth in the family. The probability of malformed offspring was increased slightly after the mother had reached the age of 30 years and was increased greatly after she had attained the age of 40 years. The commonest type of malformation was congenital hydrocephalus. An inquiry into the origins of a series of 294 cases of fœtal malformation, which occurred in a series of 13,964 consecutive births in the Liverpool Maternity Hospital, was conducted by Malpas.[3] The maternal age and birth order of each case were recorded. Congenital hydrocephalus, again, was the commonest abnormality. Comparison with the total number of births showed clearly that the incidence of hydrocephalus increased as maternal age increased. With regard to anencephalus, which was the next most common abnormality, the association with advanced maternal age was also marked. It has long been recognised that the incidence of mongolism is related to birth order or maternal age; mongolian idiots are much more likely to be born to mothers over the age of 35 than to younger mothers. The comparison, made by Jenkins,[4] of the distribution of maternal ages at the births of mongolian idiots with the ages at the births of the total children in the general population showed that the probability of the birth of a mongol child increased rapidly with maternal age. Jenkins quoted material, collected by van der Scheer and Orel, which showed that the age of the father was likely to be of less importance than the age of the mother. He also took the view that an abnormally long interval before the birth of a mongolian idiot was a predisposing factor.

The most recent survey of the literature and data bearing on the question of the relationship of mongolism to maternal age is that of Bleyer,[5] who has collected facts about 2822 cases of mongolism from institutions in the United States and Canada, from the literature, and from private sources. His analysis of the material, by Jenkins's method, demonstrates convincingly the correctness of the view that advanced maternal age is one of the chief predisposing factors in the causation of the disease in question. Special statistical techniques, such as have been proposed

[1] Still, G. F., *Lancet*, 1927, **2**, 795 and 853.
[2] Murphy, D. P., *Amer. J. Dis. Child.* 1936, **51**, 1007.
[3] Malpas, P., *J. Obstet. Gynæc.* 1937, **44**, 434.
[4] Jenkins, R. L., *Amer. J. Dis. Child.* 1933, **45**, 506.
[5] Bleyer, A., *Ibid*, 1938, **55**, 79.

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by Penrose,[6] are required for separating the effects of this cause from other possible predisposing factors, such as advanced paternal age, reproductive exhaustion due to repeated pregnancy, or long interval between births. The effect of maternal age is so strong that it does not seem possible to detect any residual effect due to these other variables. At present there is insufficient evidence on which to decide whether maternal age, birth order, or some other related factor is the chief predisposing cause in the case of congenital hydrocephalus, but it appears that the positive association with maternal age, in this and in some other congenital deformities, though significant, is not so strong as it is in the case of mongolism.

DIET AND INSULIN SENSITIVITY

In 1924 Abderhalden and Wertheimer found that variations in the composition of the diet of a normal animal alter its sensitivity to the hypoglycæmic action of insulin. In general a high-carbohydrate diet increased insulin sensitivity and a high-fat diet or starvation decreased it. Two years later Aldersberg and Porges demonstrated on healthy human subjects that while a carbohydrate-poor diet decreases sugar tolerance, a diet rich in carbohydrate has the reverse effect. These observations have been widely confirmed and accepted.

In 1932 Himsworth [7] brought forward the attractive idea that insulin is secreted by the pancreas in a physiologically inactive form, and that this form is converted into active insulin by an activator, "insulin-kinase," believed to be produced by the liver. The increase in carbohydrate tolerance and in insulin sensitivity following a diet high in carbohydrate was explicable on the basis that the administration of carbohydrate stimulates production of insulin-kinase. Himsworth's hypothesis was largely based on the form of the blood-sugar curves obtained in numerous experiments on the action of insulin, and although much cognate evidence was later brought forward, any positive demonstration of the existence of insulin-kinase in liver tissue was lacking until eighteen months ago, when a substance believed to fill the bill was demonstrated in liver extracts by Ross.[8] This investigator, taking the existence of insulin-kinase as axiomatic, showed that the administration of liver extracts improved sugar tolerance in cœliac disease and a number of other conditions. Himsworth [9] had been unable to detect any influence of liver preparations on the sugar tolerance of the normal subject.

Himsworth's hypothesis explained a dietetic increase in insulin sensitivity in terms of the greater efficiency of insulin activated by insulin-kinase. The observations were also explicable however on the basis of the removal of an inhibitor of the action of insulin, rather than the addition of an activator. Although the idea of an inhibitor seemed less probable than that of an activator when Himsworth first propounded his hypothesis, recent investigations into the rôle of the pituitary gland in carbohydrate metabolism have established the fact that a substance present in the anterior lobe can diminish or even abolish the hypoglycæmic action of insulin. The resemblance of the changes in insulin sensitivity brought about by experimental variations in the intensity of anterior pituitary action, and those resulting from changes in the diet, was very suggestive,[10] and recently Himsworth and Scott [11] have pursued this suggestion. Their results show that the changes in insulin sensitivity and sugar tolerance normally brought about in rabbits by changing the carbohydrate content of the diet are abolished in the absence of the pituitary gland. Furthermore, in hypophysectomised rabbits receiving a high-carbohydrate diet, the administration of a suitable anterior pituitary extract results in an impairment of sugar tolerance and a decrease in sensitivity to insulin similar to that occurring when normal animals are given a low-carbohydrate diet. These observations lead Himsworth and Scott to suggest that the reduction in sugar tolerance and in insulin sensitivity resulting from a low-carbohydrate diet are better explained by an increased secretion of the "anti-insulin" substance of the anterior hypophysis than by the action of an activator; although, as they point out, other factors may also be concerned. It is clear, however, that the insulin-kinase and pituitary-inhibitor theories are not mutually exclusive, since the production of insulin-kinase may be controlled by the anterior hypophysis. The assumption that a secretion of the anterior pituitary gland has an inhibitory action on the production of insulin-kinase by the liver is perhaps no more difficult than *le premier pas*.

If insulin-kinase is no more, how are Ross's results to be explained? It must be confessed that at the moment no obvious explanation is forthcoming. But facts take precedence of explanations, and it would be unfortunate for the progress of research if the discovery of new phenomena did not sometimes spring from a hypothesis that ultimately proved to be incorrect.

BLOOD LOSS DURING OPERATIONS

Few surgeons could make an accurate quantitative guess of the amount of blood lost during any particular operation. White and others [12] have recently tried to estimate blood loss by extracting the blood from towels, swabs, sucker-bottle, and so forth, and determining colorimetrically the amount of hæmoglobin present. According to this method of measurement during an operation for hernia as little as 5–10 c.cm. of blood was lost, and in extensive abdominal operations the quantity was usually 200–300 c.cm. During a radical excision of the breast which is regarded as the operation in general surgery in which hæmorrhage is usually the most severe, the quantity measured was 1270 c.cm. It is generally recognised that operations on the brain and spinal cord may be associated with a heavy loss of blood, and the figures for 37 such operations are illuminating. During the simplest procedures of exploratory craniotomy and biopsy, blood loss varied between 500 c.cm. and 900 c.cm. This figure commonly rose to 1200 c.cm. if the tumour was removed. In cases of vascular meningioma bleeding was much more profuse, at times exceeding 2000 c.cm.

These observations emphasise what is perhaps the greatest difficulty encountered by the neurosurgeon. Not only may the tumour itself be of a very vascular type, but the tissues to be divided during the preliminary steps of exposure have a liberal blood-supply. Horsley's bone wax, silver clips, endothermy, and pieces of muscle are all of the utmost value, though at times the flow of blood may be wellnigh uncontrollable. Careful hæmostasis is time-consuming and to

[6] Penrose, L. S., *Proc. roy. Soc.* B, 1934, **115**, 431.
[7] Himsworth, H. P., *Lancet*, 1932, **2**, 935; and *Clin. Sci.* 1933, **1**, 1.
[8] Ross, C. W., *Lancet*, 1936, **2**, 556; and *Trans. R. Soc. trop. Med.* 1936, **30**, 33.
[9] Himsworth, *Trans. R. Soc. trop. Med.* 1936, **30**, 54.
[10] See Marks, H. P., *Proc. R. Soc. Med.* 1936, **29**, 663.
[11] Himsworth and Scott, D. B. McN., *J. Physiol.* 1938, **91**, 447.
[12] White, J. C., Whitelaw, G. P., Sweet, W. H., and Hurwitt, E. S., *Ann. Surg.* February, 1938, p. 287.

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some extent this slowing up of the operation is beneficial, for the patient is likely to withstand the loss of a large quantity of blood if it is spread over a considerable period of time. It is well to remember, however, that the successful completion of any big cranial operation in the face of great technical difficulties usually depends upon the transfusion of blood, and the advantages in blood loss of a slow pace must be cancelled to some extent by the added toxic effects of prolonged anæsthesia.

THE DEPOSIT GAUGE

Two sections of the latest report [1] of the Atmospheric Pollution Research Committee deserve special attention. The first describes the purpose and meaning of the observations made with the deposit gauge. The gauge will not only show how much dust falls in a particular area but will also indicate the sources from which it comes. For example, tar is given off in the early stages of heating of coal or wood, and a high deposit can only be due to pollution from domestic chimneys or very inefficient industrial furnaces. Similarly a high deposit of other carbonaceous matter, consisting of fine particles of fuel which have escaped with the chimney gases, indicates bad adjustment of the air-supply or other conditions, as when pulverised fuel is burned in badly designed furnaces. The second section refers to the importance of the site of recording instruments. Deductions cannot fairly be drawn between the readings in different localities unless the positions of the instruments are fully comparable, a fact which must be borne in mind when observations are to be made in new districts. Deposit gauges give reasonably accurate readings of the impurity deposited in their own area, but their accuracy is more doubtful when applied to larger areas even in the same vicinity. It is possible to locate a single gauge so that it will represent the average deposit for a town, and, apart from the need for caution when comparing town with town on the basis of a single gauge, such a gauge will be quite sufficient to show whether the condition of the atmosphere over a moderately sized area is improving or not.

PROLONGED DISABILITY FOLLOWING FRACTURES

THE swollen and painful hand or foot is a most troublesome type of disability that may persist long after repair of a fractured limb. Fraser B. Gurd,[2] during a wide experience of accident insurance work, has examined the causes which lead to dispute between the patient and the employer about ability to return to work. In most of these cases he finds that the radiogram demonstrates bone atrophy. This atrophy is, in his opinion, not merely the effect of disuse; it is a direct outcome of the hyperæmia of the limb and associated with the swelling. The bone tissue is not affected alone. Gurd believes that there is a wide degenerative, or retrogressive, change affecting ligaments (particularly at their bone attachments), articular cartilage, and articular membranes. All these structures he regards as arising from the osteoblastoma and thus as logically participating in the primitive reversion that is one stage of bone repair. The attachments of ligaments and of tendons are loosened, pain and instability of joint movements result, swelling increases, and a vicious circle is set up.

In a properly treated fracture the period of disability is prolonged very little beyond the time required for bony union. Traumatic hyperæmia, essential in the initial stages, rapidly disappears as the limb is brought into activity. In the modern methods of splinting which allow use of the lower limb for support and of the hand for many of its normal duties, bone atrophy and prolonged swelling of joints are becoming rarer. Inadequate fixation or fixation for too short a period interferes with the resolution of the hyperæmia. The pain on attempted movement leads to spasm and increases the swelling; the X ray shows bone atrophy. Massage without resumption of function is very little good, and passive movements are probably always worse than useless. The patient remains off work for months, and everyone gets worried and impatient. Gurd quotes a case in which tuberculosis had been diagnosed in an ankle-joint which remained swollen long after injury. Histological examination was made to settle the dispute and the pathologist was able to demonstrate the existence of retrogressive changes in the joint tissues which had followed many months of disuse. In the treatment of these cases the two essentials are absolute fixation with complete relief of the insecurity and fear that pain engenders, and then use of the limb. The increased circulation needed by the muscles and joints is the best agent to counteract the hyperæmia, and recalcification of the bones will follow. The unpadded plaster cast is strongly advocated by Gurd, since padded casts gradually allow of small degrees of movement as they work loose. Dangling the limb as the patient walks on a crutch with an ununited fracture is particularly condemned.

ADRENALINE AND POST-OPERATIVE SHOCK

A SPECIAL number of a French weekly contemporary [1] records the work done on post-operative shock by Prof. O. Lambret and J. Driessens. Both in animals and man they found that trauma produces an immediate rise of blood pressure which is soon followed by a fall below the original level. The sudden rise is accompanied by an increase in the blood-sugar and a reduction of the liver glycogen (possibly already low from starvation) suggesting the action of adrenaline. Later, the blood volume, as measured by the congo-red method, falls and this is also ascribed to the action of adrenaline, which has been shown on injection to cause a fall of blood volume. Further, the blood *p*H, the alkali reserve, and the blood chlorides are all reduced and there is an accumulation of chlorides in the traumatised area. The blood-sugar level remains high for some time and this is thought to be due to proteolysis of the damaged tissues. These also give rise to an increase of the polypeptides of the blood, which is proportional to the extent of the injury and may be toxic. Occasionally the blood-urea is much raised, but the blood amino-acid level remains nearly constant. It is suggested that the injured tissues liberate their contents into the circulation where they act as an antigen and are digested very slowly. Hence the accumulation of polypeptides in the blood, their removal being hampered if the liver glycogen reserve is depleted. Leucocytosis, increase of platelets, and a raised erythrocyte sedimentation-rate occur after an operation and are also due to tissue destruction. In particular, a sudden increase in the sedimentation-rate may be characteristic of an impending pulmonary embolus, even 12 hours before it can be recognised clinically. Infra-red radiation was found to prevent

[1] Department of Scientific and Industrial Research. The Investigation of Atmospheric Pollution. 23rd Report. London: H.M. Stationery Office. Pp. 161. 7*s*. 6*d*.

[2] *Surg. Gynec. Obstet.* Feb. 15th, 1938, p. 489.

[1] *L'Écho Médical du Nord*, Jan. 31st, 1938.

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the acidosis hypochloræmia and lowered alkali reserve; infra red also prevented the fall of blood volume.

If, the authors remark, the reduction of blood volume and the toxic absorption from the traumatised tissues could be prevented, the phenomena of shock would not develop. The former can be ascribed to an exaggerated defence mechanism by which an excess of adrenaline is released into the circulation. This could be countered by the intravenous injection of hypertonic solutions to check the loss of fluid into the tissues. The toxins from the injured area will be dealt with by the liver provided that its glycogen reserve is not seriously reduced; hence the reason for giving glucose and insulin. Both these indications would be met by the following programme:—

1. Immediately after operation 100 c.cm. of 30 per cent. glucose and 50 c.cm. of 20 per cent. saline are injected into a vein and 15 units of insulin are given subcutaneously.
2. One hour after the operation repeat the insulin.
3. Two hours after the operation repeat the insulin.
4. In the evening repeat the glucose, saline, and insulin injections. These may be repeated the following morning or subsequently if necessary.

The results of this routine treatment are stated to have been good, the clinical condition of patients so treated being obviously better than in others. Inasmuch as the unfavourable changes in the blood were largely prevented by this routine, the authors also recommend it for cases of traumatic shock and severe burns in which the blood changes are essentially similar.

POLICE TESTS FOR ALCOHOL

DRIVING a motor-car under the influence of alcohol is a crime in most countries, and many attempts have been made to correlate clinical drunkenness with the alcohol content of the blood, breath, and urine. Selesnick[1] prefers the determination of blood alcohol because blood contains a negligibly small amount of non-alcoholic oxidisable material, because its alcoholic content represents the degree of alcohol saturation at the moment the sample is obtained, because it is always available, and because it can be extracted from a passive person. An alternative is offered by Harger, Lamb, and Hulpieu,[2] who describe a rapid chemical test of expired air to determine its alcohol content. They use a 55 per cent. solution of sulphuric acid containing a small measured amount of permanganate of potash. The salt, they say, reacts rapidly and quantitatively with alcohol at ordinary temperatures, and is not affected by acetone. They measure the concentration of alcohol by determining the ratio of the alcohol to the carbon dioxide: 190 mg. of carbon dioxide is equivalent to 1 c.cm. of blood. The subject need not be touched, but a tube is held in the breath-stream and a pump draws the sample through the apparatus. Harger and his colleagues tested 121 persons and demonstrated a good correlation between the blood alcohol and the breath alcohol. The difficulty in using these tests to answer the legal question whether a motorist was so far under the influence of alcohol as to be incapable of controlling a car has lately been indicated by Mr. Justice Humphreys in a presidential address to the Medico-Legal Society.[3] While, he said, the evidence of a considerable alcohol content in the blood of a person who claimed to be a teetotaller might be of value, the test would be of little use, and might be highly prejudicial, when the accused admitted having taken drink. The law wishes to know not that the accused has consumed alcohol but the effect on him of the alcohol consumed. One man can take without apparent effect five or six times as much alcohol as another. He suggested also that factors other than the blood content will determine the effect of the alcohol upon a person: the temperature of the room, the habits of the drinker, the interval between drinks, and even the nature and quantity of the diluting medium. He thought it might be unsafe to produce evidence before a lay tribunal that the blood of the accused contained the equivalent, say, of half a bottle of whisky, for the man might have been perfectly sober even after drinking that quantity. These views, expressed by such a high authority on criminal law and practice, are important. Lawyers have by no means seen—and probably never will see—eye to eye with physiologists over the effect of alcohol on a driver. The physiologist is certain that even a small quantity—not enough to cause even the faintest perceptible signs—may make a dangerous difference in reaction-time and judgment, to say nothing of other faculties. The lawyer on the other hand is slow to believe that a motorist is incapable of having proper control unless there is also evidence of something like social drunkenness. The learned judge said frankly that the evidence he preferred on such a question was that of a superior police officer who had seen the accused at the time. A finding of no alcohol in the blood would, however, probably be conclusive evidence for the defence. Biochemical tests for alcoholism are therefore likely to remain more of a shield than a sword in English courts.

[1] Selesnick, S., *J. Amer. med. Ass.* March 12th, 1938, p. 775.
[2] Harger, Lamb, and Hulpieu, *Ibid*, p. 779.
[3] *Med.-leg. Rev.* January, 1938, p. 15.

PROGNOSIS IN CANCER OF THE KIDNEY

OF 105 consecutive cases of renal cancer reviewed by E. Ross Mintz[1] 72 were treated by nephrectomy, and the follow-up showed that 45 of these patients were dead and 22 living. Of the 22 who were still alive 7 had gone beyond the five-year period, 10 had passed the fourth year, and 5 were without clinical recurrence after three years. These figures make melancholy reading, and the high mortality-rate undoubtedly comes from inability to make an early diagnosis. The disease is by nature insidious, and often the patient first presents himself because of a metastasis, having had no urinary symptoms at all. Unfortunately, copious hæmaturia is by no means a common early sign, and pain is even less reliable as a symptom. Hopes have been entertained that post-operative irradiation might improve the prognosis, but it has not been proved to do so, and in the absence of confirmatory evidence a surgeon must feel some hesitation in prescribing a form of treatment which produces considerable reaction in an already debilitated patient. Mintz ends his review by saying that results will only improve when the diagnosis is made while the growth is still in its early stages. But how is this to be achieved?

[1] *New Engl. J. Med.* 1937, 217, 1066.

CENTRAL ASSOCIATION FOR MENTAL WELFARE.—A course for those engaged in the training of mental defectives in occupation centres, institutions, or mental hospitals, and for home teachers has been arranged by this association and will be held in London from July 4th to 23rd. Further information may be had from the educational secretary of the association, 24, Buckingham Palace-road, London, S.W.1.

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CONTROL OF THE COMMON FEVERS

MEASLES

Reviewed by DR. WILLIAM GUNN, *Medical Superintendent, North-Western Fever Hospital, London County Council*

THE confident forecasts of epidemiologists regarding the biennial periodicity of measles are being upheld by current reports of outbreaks of the disease in various districts, and an increased incidence sometimes amounting to epidemic proportions, in areas where the disease usually remains endemic. While the expected London epidemic is later in making its appearance than usual, there has been in the last few weeks an increasing incidence of cases which suggests that the epidemic is approaching its peak. No exact figures are available since measles is not a compulsorily notifiable disease in the whole of London, but the number of cases reported from the London County Council elementary schools form a reliable guide as to prevalence generally; in the last four weeks * the weekly numbers so reported were 1551, 2165, 2521, and 2079. In addition, the number of patients admitted to the L.C.C. fever hospitals provide a guide of severity as well as of incidence, for only severe or complicated cases are deemed to require hospital treatment.

During the last four consecutive weeks * for which returns are available the average daily admissions to the London fever hospitals were 68, 86, 101, and 94. From various parts of the British Isles are arriving confirmatory reports of the steadily increasing prevalence of measles. In Glasgow the notifications for the last four consecutive weeks * were 1264, 1247, 1188, and 1037; the small weekly decreases indicate that the epidemic has probably passed its peak; in Edinburgh the recent notification figures suggest that the peak has also been reached, the numbers notified for the last four weeks * being 114, 66, 105, and 90, while in Aberdeen and Dundee small but increasing numbers are being reported. During the same period the notifications for the whole of Scotland were 1653 (22), 1747 (21), 1718 (16), 1547 (24); the figures in parentheses denote measles deaths in each week. Belfast has been visited for over two months by a severe epidemic which has taxed the resources of the hospital accommodation. In recent weeks the epidemic appears to be on the wane; the measles notifications in the last four consecutive weeks * have been 281, 217, 168, and 98.

Administrative Measures

The above returns provide ample evidence that measles is at present widespread in the British Isles; in the majority of areas the epidemic is in the early stages but in one or two centres it may have reached or have just passed its peak.

COMPULSORY NOTIFICATION

The serious gaps in our knowledge of the ætiology and dissemination of measles must raise anew the question whether notification should be adopted generally. A trial of compulsory notification in England and Wales was made in the years 1915–19 when the medical attendant was required to notify only the first case occurring in a household, the duty of notifying subsequent cases devolving upon the parents or householder. Since 1919 certain sanitary authorities have adopted compulsory notification for varying periods. Notification as at present applied is usually limited to the first case in a household occurring within two months—i.e., subsequent cases are notified only if they appear at an interval longer than two months after the first case, while in a few areas a further restriction is made by limiting notification to children under 5 years of age. In only one metropolitan borough (Fulham) are all cases of measles required to be notified.

Opinions vary on the merits and advantages of compulsory notification, and the disappointing experience of the 1915–19 experiment is usually cited, probably without adequate justification, as being a decisive reply to its advocates. At that time the public health services, particularly domiciliary supervision by health visitors and sanitary inspectors, were comparatively restricted and ill-organised, the available fever hospital accommodation was generally inadequate to cope with large numbers of admissions in a brief space of time, and the serum control of measles had not been introduced into this country. Furthermore, even prompt removal of cases to fever hospitals is unlikely to play any great part in reducing the incidence of the disease, as infectivity is highest in the early pre-eruptive stage when recognition is usually difficult and may be impossible. While the measles death-rate figures in the last quarter of a century have shown an appreciable decline, it would be difficult to attribute this trend to the effects of notification. In 1910 the measles death-rate per 1000 living was 0·44, and in 1920 0·22; in 1930 and 1931 the figures were 0·23 and 0·03 respectively; while in 1936 and 1937 they were 0·14 and 0·01. It is of moment to observe that only since the late war do alternate years show wide differences in fatality as well as in morbidity. The decline in mortality has been ascribed to the fall in the birth-rate, but this can at best provide only a partial explanation. Improvement in nutrition, lowered incidence of debilitating diseases such as rickets, tuberculosis, and the deficiency diseases, and a higher standard of hygiene have undoubtedly played an important part. Nevertheless, valuable epidemiological observations were made during the period while measles was notifiable in this country.

It was seen that the disease is most prevalent in temperate climates in the winter and spring months, being endemic in large centres of population and liable to explosive epidemics at approximately two-yearly intervals. Epidemics, however, tended to persist well into the summer months, when enteritis usually replaced broncho-pneumonia as the chief cause of death. Mortality was seen to be highest in April and lowest in September, and was higher in the North and Midlands than in the South, owing in all probability to the greater overcrowding and lower standard of living in the highly industrialised centres; cold and damp and unfavourable atmospheric conditions generally also exerted an unfavourable influence on the prognosis. The attack-rate was seen to be highest in the age-group 3–4, but fatality was greatest in the first year of life. Fatality was seen to remain high until the third year, when it fell steeply; in children of 5 or over, measles was shown to be a comparatively trivial disease. Case mortality tended to rise again after 15, and is very high—although the disease is rare—in old people.

The general inference to be drawn from these observations is that postponement of attack to the later age-groups is the most important single factor in the lowering of measles mortality, while reduction of the magnitude of epidemics and increased spread over a

* Ending March 19th.

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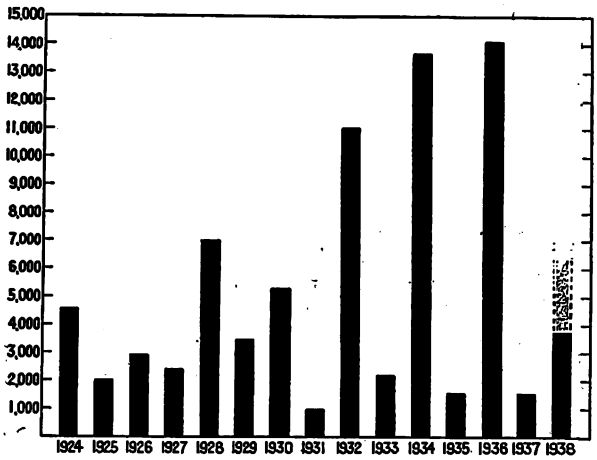

FIG. 1.—Annual measles admissions to London Fever Hospitals (M.A.B. and L.C.C.) 1924 to March 19th, 1938.

longer time are of somewhat less importance, although in practice these factors mutually support each other. Mere prolongation of an epidemic is advantageous in two directions: attack is deferred until the dangerous winter months are over, and medical and nursing services are enabled to cope with the cases as they occur, overcrowding in fever hospitals being avoided.

HOSPITALISATION

The admission of measles cases to hospital on a large scale is a post-war development that is being applied more and more during each successive epidemic. The yearly admissions to the London fever hospitals since 1924 illustrate this trend admirably and are shown on Fig. 1, though the biennial periodicity is somewhat obscured by the fact that yearly admissions have been recorded, while each epidemic period usually embraces part of two years. In the last three epidemics the numbers admitted are seen to have increased greatly, although it is probable that the total incidence of measles in London has shown little change from epidemic to epidemic. It may well be that the size of epidemics is diminishing. The increasing hospitalisation of measles cases suggests that public health authorities have decided that education of parents on elementary nursing and hygiene and the domiciliary supervision of cases by health visitors have to some extent failed of their purpose. The policy of increased hospitalisation of measles can only be justified if the available accommodation is reserved for potentially serious or complicated cases, but considerable difficulty must be expected in making a just selection of cases. One is not justified in ascribing the diminishing fatality-rate to the effects of hospital treatment, since measles mortality was seen to decline before the policy of hospitalisation was generally adopted. Nor can the fall in hospital fatality-rate be properly attributed to improved therapeutic measures and equipment available nowadays in hospitals. More probably the recent favourable results are due entirely to the fact that an increasing proportion of cases, many of them too mild to need hospital treatment, are in fact being admitted. The measles admissions figures for the London County Council hospitals over the period 1927–36 appear to bear this out. They are as follows:—

	1927–28	*1929–30*	*1931–32*	*1933–34*	*1935–36*
Admissions ..	8,729	6,452	11,526	12,896	13,156
Deaths ..	626	422	647	712	494
Case mortality	7%	6·5%	5·6%	5·5%	3·8%

The figures given for the first two epidemics relate to London County Council fever hospitals only; for the last three epidemics they embrace admissions to fever and general hospitals (L.C.C.).

Those who oppose the policy of large-scale hospitalisation of measles cases can generally quote

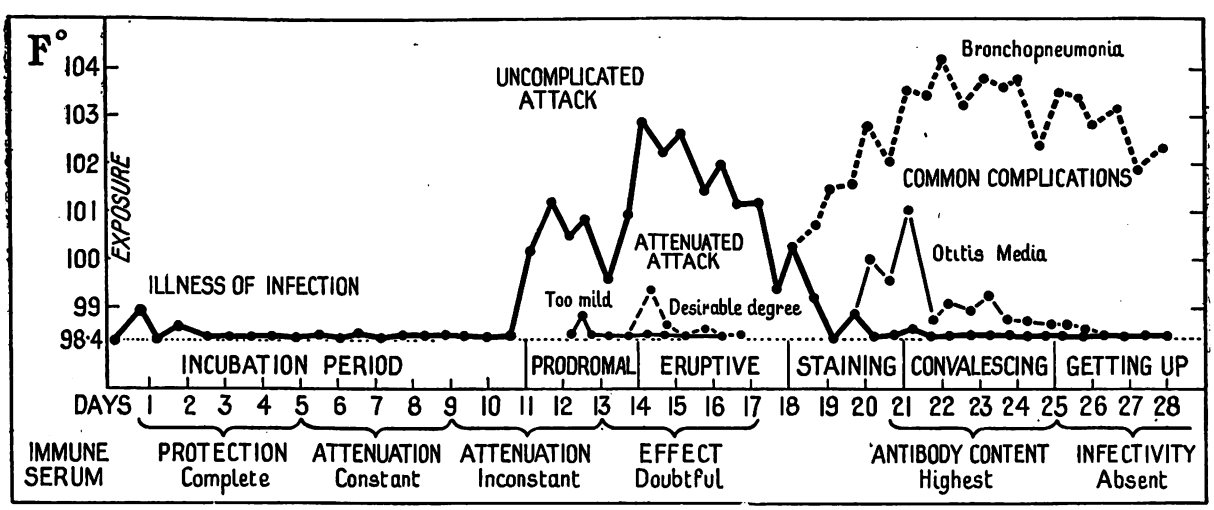

FIG. 2.—The effect of serum on the course of the attack in the London Measles Epidemic, 1935–36. The dosage of serum and the time-table of its administration are as follows:—

Nature of serum.	Dose in c.cm.	Dosage factor.	Route.	Prophylaxis.		Treatment.
				Protection.	Attenuation.	
Convalescent ..	5–20.	Age × 2.	Intramuscular.	1st–5th day.	5th–9th day.	Within 6 days of onset. Dosage factor: age × 4. Route: intravenous.
Normal adult ..	10–40.	Age × 4.	Intramuscular.	1st–3rd day.	3rd–9th day.	
Whole blood ..	Double its serum.	Age × 4.	Intramuscular.	1st–3rd day.	3rd–9th day.	
Placental extract	7·5–30.	Age × 3.	Intramuscular.	1st–3rd day.	3rd–9th day.	—

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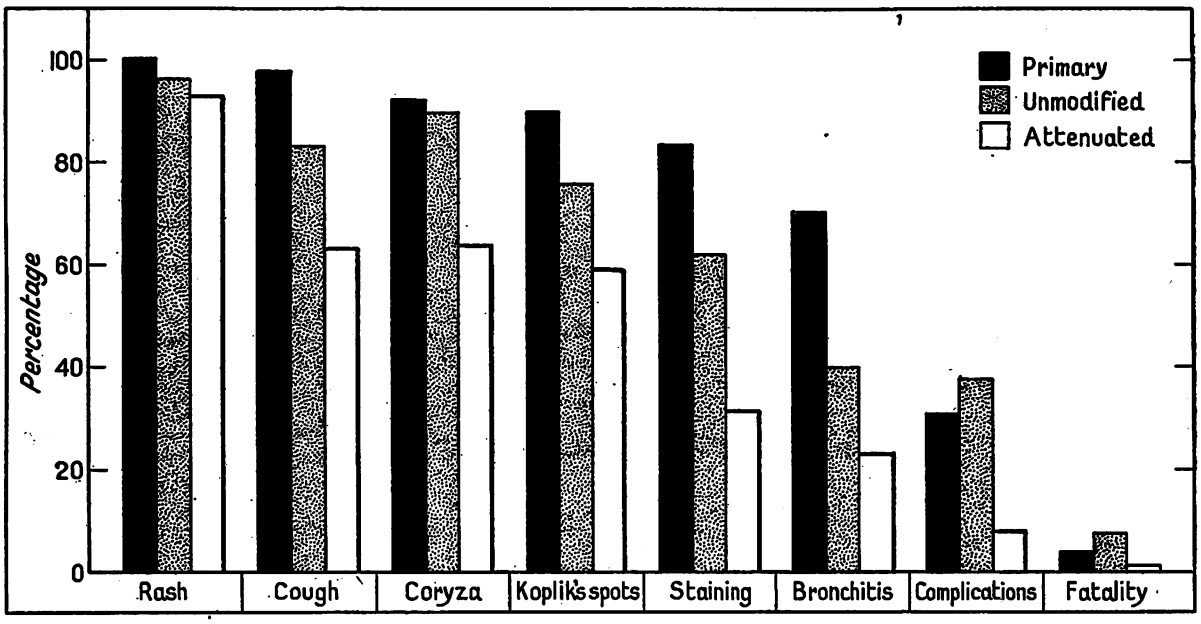

FIG. 3.—Frequency of initial and main manifestations, complications, and fatality-rate in measles in (*a*) primary infecting case (controls), (*b*) unmodified, and (*c*) attenuated attacks.

statistics which prove that both complications and fatality-rates are higher amongst hospital cases than amongst home-nursed cases. They are merely proving that hospitals are places in which deaths are more frequent than in private houses, which is only to be expected inasmuch as patients are usually sent to hospital when there is a definite threat to life. No figures are available that could rightly be employed to effect a direct comparison between hospital and home-nursed cases. The untoward effects of hospitalisation of measles are those that are incidental to the close aggregation of large numbers of susceptible individuals, no matter what the reason for which hospital admittance is sought. The chief objection—the liability to other infectious diseases or to infectious complications such as upper respiratory infections and enteritis—is now being removed as increased individual isolation accommodation is being provided at the fever hospitals. Likewise, the unfavourable psychological effects of segregation on certain young children may be avoided by the use of glass partition cells and by cutting down the period of isolation to a minimum.

Treatment

Probably the necessity of providing the facilities of hospital care would be abolished if a specific remedy were available, simple and safe enough to be used in the home. Unfortunately no sovereign remedy has as yet been discovered; indeed the measures which have been found of most benefit are elaborate and expensive or require special experience to apply successfully. Pyramidon and, more recently, sulphanilamide have roused enthusiastic hopes, but experience has shown both drugs to be of little therapeutic value and not devoid of danger if pushed too far. Immune measles serum, preferably convalescent serum, has been given in treatment in doses of 10–50 c.cm., by the intramuscular or intravenous route, to selected cases in the pre-eruptive and early eruptive stages; some few appear to have benefited but the results have never been dramatic and are usually disappointing. Such improvement as has been observed is possibly attributable to complement and allied bodies, or even to streptococcal antitoxin, in the serum rather than to a specific anti-measles action. Antiscarlet fever serum is frequently given in hospital practice by the intramuscular route in doses of 10–30 c.cm. when septic complications threaten, since hæmolytic streptococci are by far the commonest secondary invaders in measles. Pneumococci and the Pfeiffer's bacillus are less frequently found, but no serum of proved value is available for combating their invasive properties. In like manner, antidiphtheritic serum has proved of value in diphtheria prophylaxis because the mucous membranes damaged by measles are particularly prone to infection by diphtheria organisms.

Prophylaxis

ISOLATION

Attempts to avert measles epidemics or even to alter their trend appreciably by isolation measures alone have proved useless. This failure is attributable chiefly to the high infectivity and dispersibility of the disease as well as to the great susceptibility of those who have not undergone attack. A small proportion appears to escape by virtue of partial and usually temporary immunisation through subclinical infection, but these cases do not materially affect the general character of the disease, whether in individuals or in the herd. Other means, therefore, have to be sought to protect the individual at a time when a measles attack might be dangerous to life or so to modify the nature of the attack as to render it innocuous.

SERUM PROPHYLAXIS

The control of measles in individuals or groups of individuals is most easily effected by the administration of immune measles serum. According to the type and dose of serum and the interval elapsing between exposure and the time of injection, either complete protection, which lasts from 14 to 21 days, or modification of attack, which appears to confer lifelong immunity, can be secured. Complete protection

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is preferred for children under 3 years of age and for those of all ages in whom acute or chronic debilitating disease might render the prognosis in an attack of any kind doubtful. For administrative reasons, as in hospital ward outbreaks or for domestic reasons to prevent spread amongst immediate neighbours, prevention may be preferred to attenuation. In general, however, attenuation of attack is the ideal aim and fortunately may be secured almost as easily by means of adult (normal) serum as by convalescent serum, although in protection it is not so reliable. Recently, placental extracts (McKhann and his co-workers 1933, 1935) have been prepared by extracting the globulin fraction from human placentas; these substances have been used with success both for protection and attenuation, but generally speaking they are only slightly more effective than adult serum. Moreover, the severe local and constitutional reactions that may be produced in some individuals, lasting from 12 to 36 hours, are a serious objection to their unrestricted use. The different kinds of immune sera and blood available and the conditions of their successful administration are shown in Fig. 2.

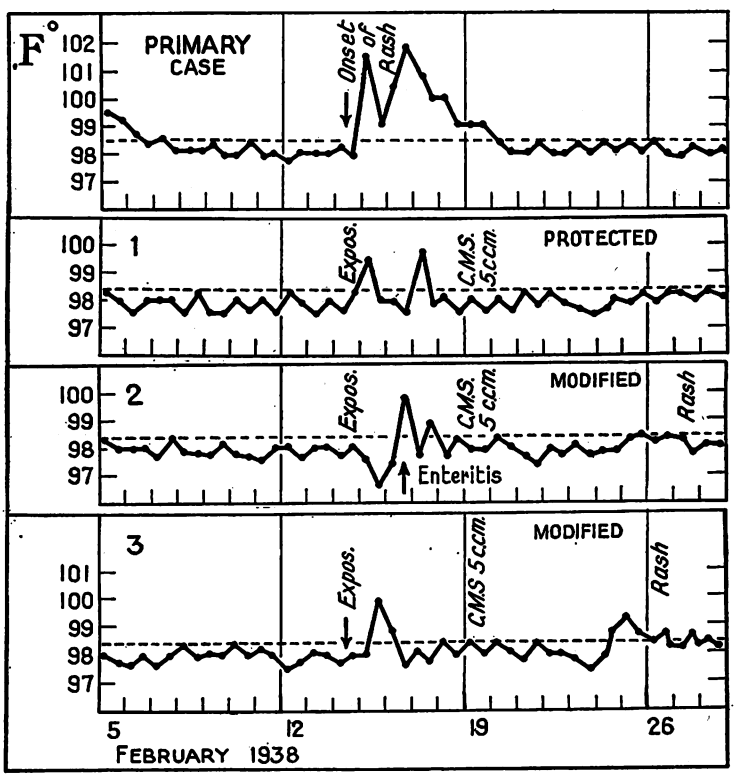

FIG. 4.—Introduction of measles into whooping-cough ward; among 16 non-immune contacts three showed the "illness of infection." One of the inoculated was apparently protected by serum, while the remaining two had markedly modified attacks, showing less fever and constitutional disturbance than the illness of infection. Expos = date of exposure to infection. C.M.S. = convalescent measles serum.

Immune measles sera of whatever kind and however prepared are difficult to assess as regards potency. Placental extracts are usually standardised by estimating the amount of protein they contain; this method can form only an approximate guide to their antibody content. Occasionally the Debré phenomenon (rash inhibition) may be available as an index to potency, but in actual practice clinical trial of an unknown serum remains the most reliable method of biological assay. Too often all the serum belonging to one batch has been already injected before a decision as to its potency is possible. Since controls of protective experiments are rarely available nowadays because every known contact receives the benefit of immune serum, reliance is usually placed on attenuation experiments for testing serum potency. A comparison is best effected by comparing the frequency of the initial and main manifestations of measles and the complication and fatality-rates which follow in those who have been injected with those from whom serum has been withheld.

It is seen in Fig. 3 that the unmodified group fared even worse than the controls (uninjected); this is probably due to the fact that the majority of the controls suffered from measles only while all the unmodified group (as all the attenuated group) suffered from other concurrent diseases, often of considerable gravity. For this reason the fatality- and complication-rates in the unmodified group was greater than among the controls although the other measles manifestations were milder.

The worst defect of serum prophylaxis arises from the fact that we cannot be certain whether or not exposure has been sufficiently intimate to ensure invasion. This is of no great moment if protection is the aim, although the proportion of resulting successes may be unduly exaggerated if the chances of effective exposure are remote. On the other hand, if attenuation be the aim serum is wasted if through non-exposure apparent protection has followed inoculation. Although the incubatory stage is usually described as a "silent" period, three phenomena may be observed which, singly or combined, may assist in deciding whether invasion has taken place. At the time of exposure a febrile disturbance with coryzal symptoms, and occasionally a transient face rash, occur in a small proportion of cases. Goodall (1925), who first described the condition, was inclined to consider the reaction a miniature attack of measles, but this is unlikely since attacks of normal severity invariably follow at the end of the normal incubatory period. Meunier (1898) described a loss of weight amounting to 4 or 5 oz. in young contacts on the 5th to 8th day of the incubatory period, but the phenomenon is too inconstant to merit reliance. More valuable is the blood picture; a polymorphonuclear leucocytosis appears about the 5th day and alters to leucopenia just before the onset of the rash, but the appearance of the blood changes may be prevented by the use of immune serum or the presence of antecedent disease with characteristic blood changes, such as those seen in whooping-cough, may obscure changes arising from measles. The temperature charts of the primary infecting case and three contacts who showed Goodall's sign, two of whom subsequently developed serum-attenuated measles in a recent ward outbreak, involving in all sixteen non-immunes, is shown in Fig. 4.

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The difficulties and uncertainties encountered in the application of the serum prophylaxis of measles are great but need not be unsurmountable. The disease should be prevented or postponed in the young and sickly, but in healthy children of over 3 years of age deliberate exposure followed by injection of serum of known potency is a simple and justifiable procedure. The majority of experiments in which the method has been employed have met with complete success. More difficulty is felt in securing supplies of serum at short notice. At present stocks of varying amounts, chiefly of adult serum, are held by the public health authorities of the principal cities and towns of this country; the majority have found it convenient to enlist the aid of a laboratory specially equipped for the work of preparing sera. The Wellcome Research Physiological Laboratories, Beckenham, have undertaken this work and other makers of biological products, such as Evans Sons Lescher and Webb Ltd., are also prepared to do the same work. The largest stock of immune serum in this country (convalescent, normal adult, and placental extract) is held by the L.C.C. for use in their hospitals and institutions, but few requests for supplies are refused if made by or through local medical officers of health. To avoid the serious loss of potency amounting to 25 to 50 per cent. in one to two years, which serum suffers from ageing, large stocks are being dried by this authority, in which state they appear to retain their potency indefinitely. Placental extracts (Lederle's immune globulin) are marketed in this country by Messrs. Chas. F. Thackray of Leeds.

ACTIVE IMMUNISATION

The ease and comparative success that has attended the use of immune serum has diverted the attention of workers in this field from the earlier attempts of those who regarded some form of active immunisation as the ideal measure in measles control. As long ago as 1759 Home of Edinburgh claimed to have successfully vaccinated by scarification non-immunes with infective blood taken from measles patients in the early stages of the disease, but subsequent workers failed to confirm his observations. More positive success attended the experiments of Hermann (1914), who instilled successive daily doses of filtered naso-pharyngeal washings from measles subjects into the nares of 3–5-months-old infants in the hope of maintaining or enhancing their temporary immunity obtained by the placental circulation. The occasional occurrence of serious accidents such as attacks of unmodified severity—since it is impossible to predict exactly when an infant will lose its immunity—was responsible for the method rapidly falling into disrepute. In 1918 Nicolle and Conseil followed inoculation of convalescent serum by 1 c.cm. of blood recently withdrawn from patients in the pre-eruptive stage of measles and in the following year Richardson and Connor supplemented Hermann's technique by the addition of convalescent serum. All these procedures proved either too dangerous or too unreliable for clinical practice, but some modification or refinement of technique may well lead to success, which the limitations inherent in serum prophylaxis forbid.

I desire to thank Dr. J. A. H. Brincker, principal medical officer of the public health department, London County Council, for his advice and his coöperation in placing at my disposal much of the statistical material in this article.

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SPECIAL ARTICLES

ANÆSTHETICS BY MIDWIVES

THE administration of anæsthetics by midwives is still in the experimental stage and a number of points must yet be settled before a satisfactory degree of anæsthesia is available to every mother. The Central Midwives Board, who are morally if not legally responsible for such anæsthetics, were advised in the first place by the British College of Obstetricians and Gynæcologists, and no doubt feel that until they have had more experience they must be guided by the rather cautious advice of that body. Criticism of the scheme has so far been levelled entirely at its inadequacy; there appear to have been no suggestions that it is unsafe. The rules of the Central Midwives Board, as stated in their report for 1937,[1] allow the midwife to administer gas-and-air by "Minnitt's or similar apparatus" provided she has received special instruction and been found proficient in the use of the apparatus; provided the patient has been examined by a doctor within one month of her confinement and certified fit for gas-and-air administration; and provided one other person (being a certified midwife, a registered nurse, a senior medical student, or a pupil midwife) is present.

A committee of experts have drawn up the following schedule of the requirements of an apparatus if it is to be regarded as similar in all essentials to Minnitt's apparatus:—

1. It must be capable of delivering only nitrous oxide and air when nitrous oxide cylinders are attached to it.
2. It must be so arranged that the proportion of nitrous oxide and air cannot be altered by the midwife.
3. The proportion of air delivered by the apparatus must be not less than 55 per cent. when the apparatus is tested under the following conditions—viz., at a temperature of 65° F., the mixture being delivered through a corrugated tube with an effective diameter of $\frac{3}{4}$ in. at a pressure equal to that of normal inspiration—i.e., $1\frac{1}{4}$ in. of water.
4. It must not permit rebreathing.
5. It must have an efficient reducing valve.
6. It must have an efficient intermittent flow device.
7. The air inlet must be so arranged that it is not possible accidentally to occlude the air holes.

With regard to the clause which limits the strength of gas to 45 per cent., John Elam[2] has found that

[1] Report of the Central Midwives Board for 1937. London: H.M. Stationery Office. Pp. 19. 4*d*.

[2] *Lancet*, March 5th, p. 578.

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this proportion is too weak to give an adequate analgesia, and he favours fixing the strength of gas instead at 60 per cent. "I am quite sure," he says, "that no ill effects can result from using a mixture of this strength. To persevere with the fixed 45 per cent. is going to lead to a large number of failures." He quotes[3] 1500 cases which have received about 60 per cent. gas at the Wellhouse Hospital, Barnet, with one death from post-partum hæmorrhage. Of the 880 primiparæ in this series, 541 experienced no pain after gas-and-air was started; 331 found great relief; and only 8 expressed themselves as disappointed. Of the 620 multiparæ, 332 had no pain, 280 reported great relief, and again only 8 were disappointed. It seems then that 60 per cent. of gas gives a highly satisfactory degree of analgesia. Chassar Moir,[4] however, maintains that until Elam's claim is supported by strong evidence, a prolonged reduction of oxygen intake from 20 per cent. (as in normal air) to 8 per cent. must be regarded as a serious matter. The resulting anoxæmia, he says, can scarcely be beneficial to the mother, and if it is maintained during the actual delivery must surely be prejudicial to the safety of the fœtus. In his view a more satisfactory analgesia with equal safety is obtainable from an apparatus delivering pure gas, with a device preventing the inhalation of more than 110 ounces of gas (2 to 3 breaths) at one time. R. J. Minnitt, on the other hand, has found that inadequate analgesia with an apparatus conforming to the Board's requirements has resulted only where some error of technique has been committed by an attendant not thoroughly conversant with the method.

The cost of gas-and-air anæsthesia is not great. Four types of apparatus have so far been approved by the Board ranging in price from 8 to 16 guineas, and the cost of the gas itself would not exceed 2*s*. 6*d*. for an average confinement. It appears to be the opinion of practising midwives that although with the present fixed percentage of 45 per cent. gas an optimum anæsthesia is not practicable, the relief provided, aided by a certain psychological effect, is sufficiently great to be worth while.

As with any other semi-automatic anæsthetic apparatus, the administrator of gas-and-air must clearly be thoroughly familiar with the method and must pay careful attention to its details. Before allowing a midwife to give an anæsthetic the Central Midwives Board require her to attend two lecture-demonstrations by a specialist anæsthetist, to administer gas-and-air under supervision to at least 20 patients, and to obtain from the institution at which she has trained a certificate of proficiency. The Board do not, therefore, themselves examine or certify the proficiency of midwives, but limit themselves to approving the institutions which are allowed to do so. A midwife in private practice may, in the ordinary way, obtain a certificate of proficiency after a fortnight's course, and in Minnitt's opinion this should ensure that patients receive the best available relief. A certain degree of skill and willing coöperation are also required of the patient. As some 21 to 24 seconds elapse between the first inhalation of the mixture and satisfactory analgesia she must begin to inhale at the slightest indication of a pain, and she is the only one who can tell when a pain is coming. In the bearing-down stage she must take five or six breaths of gas and then hold her breath and push. It is obviously impossible to explain complicated manœuvres of this sort to a flustered and probably frightened woman in severe pain, so that instruction in the method should be part of routine antenatal care during the last month of pregnancy.

The regulation that a qualified or partially qualified person must be present with the midwife during the administration, though simple in an institution, is a serious limitation in private practice. The essential duties of such a person are presumably to pick up the mask if it falls on the floor and to hold it on the patient's face during the final stages of delivery, and such assistance should not be beyond the power of any untrained woman of average intelligence. At present, since students are rare outside hospitals, this regulation entails the attendance of an additional qualified midwife or nurse and almost prohibits the use of anæsthesia where expense has to be considered.

[3] *Practitioner*, March, 1938, p. 249.
[4] *Lancet*, March 12th, p. 634.

MEDICINE AND THE LAW

Dispute over Hospital Guarantee

THE Ilford county court on March 14th began the hearing of a claim by the King George Hospital against Mr. Harold Meech, which raised an interesting question of the duration of a guarantee. The defendant's son was admitted into a private ward on July 24th, 1935, suffering from what was discovered to be Hodgkin's disease from which he ultimately died. Three days after the son's admission the father signed the usual form of guarantee at the request of the hospital. The boy remained in the private ward till the last week in August when he went home. There was at this time, apparently, an idea that he might receive his treatment as an out-patient. But on Sept. 9th it was found necessary to send him back to the hospital. Mrs. Meech, his mother, seems to have been told that on this second admission he could go into the general ward; she wished him, however, to go into a private ward. The payments for the first period of treatment were made either by Mr. Meech or Mrs. Meech. All the weekly accounts and receipts were sent to Mr. Meech. The hospital contended that, in the absence of any express statement to the contrary, the guarantee continued to run in respect of the second period; the defendant contended that it was terminated when the patient left the hospital in August and could not be automatically revived on the second admission in September. The judge reserved judgment.

Legacy to Charity with Impossible Condition

In re Hovenden is a case in which the court managed to uphold a charitable bequest in the face of difficulties. Mr. Hovenden left £1000 each to the Royal Hospital and Home for Incurables and to the National Benevolent Institution. The governors of these two bodies were to invest the money and use the income "to provide some form of amusement to be settled by a committee of five of the patients of each of the said institutions." There was no trouble about the bequest to the Royal Hospital and Home for Incurables; it had resident "patients" and was willing to accept the legacy and carry out Mr. Hovenden's wishes. But the National Benevolent Institution possessed no hospital or almshouse. It was a voting charity; it provided small pensions for aged and reduced members of the upper and middle classes of society; its pensioners lived in their own homes and could not be described as "patients." The treasurer, who stated these facts in an affidavit, explained that

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the institution was not in a position to carry Mr. Hovenden's directions into effect. Mr. Justice Simonds found himself able to construe the gift as one indicating a general charitable intention to which was added a particular intention which could not be carried out. The gift, he said, would prevail although the condition could not be fulfilled. The legacy would go to the National Benevolent Institution which would not be put upon terms as to the disposal of the money.

A Question of "Sound Disposing Mind"

After a prolonged hearing Mr. Justice Henn Collins has given judgment for the disputed will in North *v.* North. The late General North made his will on March 13th, 1936. His two brothers propounded it for probate, but his son challenged it on the ground that the testator was not of sound mind, memory, and understanding at the time and did not know and approve the contents of the document. He said that General North had a cerebral attack in July, 1935, and thereafter suffered from delusions and formed an unreasonable hostility towards his son. Medical witnesses were called by both sides. Dr. R. G. Mathews of Kirkby Lonsdale, who had attended the North family for many years, said that on March 17th, 1936 (four days after the date of the will), he found General North in a confused mental state, acting in a childish manner and giving the impression that he was not clear in his mind. The witness diagnosed cerebral thromboses and considered that these were the cause of the testator's death three months later. His conversation was abnormal; he thought he was back in his soldiering days; he confused Hitler and Mussolini and he forgot what room he was in. Dr. J. G. Porter Phillips, on the other hand, thought that the evidence suggested that the general's condition in July, 1935, was due to heat and fatigue in an elderly man possibly suffering from arterio-sclerosis. If there had been a thrombosis on this occasion, it must have been a very slight one. Persons suffering from cerebral thrombosis were able to pull themselves together and focus their attention on what they were doing. Dr. R. D. Gillespie said the various symptoms described indicated brain disorder. In reply to the judge, he said he would not himself have witnessed the will on March 13th; he thought the general might have formed a warped judgment and yet have understood what he was carrying out. The judge, evidently impressed by the testimony of the solicitor as to the condition of General North at the time of the making of the will, came to the conclusion that the testator knew and approved the contents of the document; he had shown considerable acumen in discussing the will and had given his attention to the matter for a full hour, dealing lucidly with any questions put to him. The general had made no provision for his son because he was already provided for. His son put this forward as an insane delusion. But there was justification for the general's view other than the influence of mental disease; he had held this view as long ago as 1931. There was enough to account for the testator's dispositions apart from their being due to disease. During the first three months of 1936 the deceased had suffered from some condition which affected the normal supply of blood to the brain; but the disease had not so far advanced as to cloud his judgment. The court held that General North was of sound disposing mind when he executed the will in March, 1936. Probate was decreed of that will, with an order that each side should pay its own costs.

RHEUMATISM AND HYDROLOGY

INTERNATIONAL CONGRESS AT OXFORD

ELEVEN countries were represented at the International Congress on Rheumatism and Hydrology which opened in London on March 25th with a Government reception at Lancaster House, where the guests were received by Sir KINGSLEY WOOD, the Minister of Health. On Saturday visits were paid to hospitals and institutions in and around London, and in the evening Lord DAWSON received the delegates in academic dress at the Royal College of Physicians.

The first group of discussions was taken at Oxford in the first half of the present week. In formally opening the session, in the Sheldonian theatre, Sir FARQUHAR BUZZARD expressed his hope that money might be forthcoming to establish rheumatism centres where the statistician, the social worker, the clinician, and the pathologist could work together under the guidance of an expert in preventive medicine. Money so invested would, he felt sure, show a good return. The two main subjects of debate at the meetings were the effect of wet and dry climates and weather on the causation of disease, and juvenile rheumatism in its various aspects. A few extracts follow from the numerous papers contributed to these subjects. On Thursday afternoon the congress adjourned to Bath where Lord HORDER was to preside at the opening of a conference on Gout and Rheumatism of Metabolic Origin.

Climate in the Causation of Disease

Dr. G. EDSTRÖM (Lund) said that the most important feature of a climate was its lability, its abundance of cyclones and anticyclones. No direct parallelism had been established between meteorological factors such as atmospheric pressure, temperature, humidity, and cooling factor, and the general death-rate or the incidence of certain diseases. Pulmonary tuberculosis, rheumatic fever, heart diseases, and acute lung diseases varied in different seasons and localities but gave no positive correlation with climatic conditions. He had himself been unable to reveal any correlation between the frequency of rheumatic fever and the absolute or relative humidity or the rainfall. Relatively high humidity and relatively high rainfall however generally accompanied great variability of climate and this association was likely to underlie the instances of correlation between humidity and disease. In Europe the highest number of people above 80 years of age were found in Sweden, Norway, Eire, and the Faroe Islands, countries with the most variable, biologically oppressive climate. The electrical factors of the atmosphere were, he thought, important—for one reason they were exerted at a distance and juncture when other climatic elements were still unchanged; pain felt in scars usually arose before barometric changes were recorded.

Prof. B. DE RUDDER (Frankfort-on-Maine) also spoke of the group of phenomena related to the passage of air masses, the alternation of cyclones and anticyclones, and their lines of aerosol interface. He thought that the exciting cause of disease from these conditions had not so far been determined though it was almost certainly not one of the meteorological elements which could be isolated and measured at present.

Dr. E. P. POULTON (London) said that fluid loss from the skin was two or three times greater than

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that from the lungs at 68° F. and as much as ten times as great at 86° F. Alveolar air was little short of saturation with aqueous vapour and so the amount of water excreted from the lungs depended on the difference between the humidity of the atmosphere and saturation point at blood heat. At ordinary temperatures, however, the loss from the skin depended on the difference between full saturation of the surrounding air at room temperature and the actual vapour pressure—a figure known as saturation deficiency. Absolute and not relative humidity was thus the important factor and he had therefore plotted average monthly values for humidity against temperature on a diagram which also showed the relation of the aqueous vapour in saturated air to the temperature; the graphs provided a measure of climate which was easier to assess than relative humidity. In this way he had obtained striking curves for Great Britain, India, and neighbouring places. Though the stations had their characteristic curves they could be divided into types, depending on proximity to the sea and altitude, while the effect of profuse rain in raising humidity but lowering the temperature was shown particularly well at inland stations such as Agra. A comparison of climatic conditions in areas reputed to be beneficial for the tuberculous with the conditions in other areas suggested that dryness of climate might be an agent against tuberculosis. The conditions in Davos for instance differed little from those of England except in temperature, altitude, freedom from dust, electrical changes, and humidity. The temperature was unlikely to have much effect as patients were usually kept indoors when it was cold. He had been so struck with the possibility that dryness had therapeutic value that he had evolved a tent for treating tuberculosis, but it was as yet too early for clear-cut results.

Juvenile Rheumatism

PATHOLOGICAL ASPECT

Dr. A. G. GIBSON (Oxford) defined the disease he was describing as one of any child or adolescent suffering from pain in the limbs not due to debility, uncorrected orthopædic conditions, tuberculous and syphilitic arthritis, and the acute staphylococcal bone diseases. The factors of cold and damp in its determination were, he said, beyond question. The disease occurred commonly in the first cold spell of autumn, was associated with damp houses, was more prevalent in wet climates than in dry, and was more prevalent in the parts of a town near a river than in those remote. It was one of the diseases of childhood in which the patient had to be protected from chill. It was prevalent too with certain families and in its incidence followed acute infections, especially those due to the streptococcus which also precipitated relapses. The primary streptococcal infection was most commonly in the upper respiratory tract, a silent period of 7–21 days then followed, after which the true manifestations appeared. The morbid appearances, especially in the heart, approximate to those of tubercle rather than those of a streptococcal infection, and though streptococci could be found on the surface of the cardiac lesion, they were rare in the connective tissue and capillaries. The frequency, however, of the anatomical cardiac signs of rheumatism suggested that the main ætiological factor was very common. The blood picture and sedimentation-rate and other features in the later phases favoured rather a coccal ætiology than a virus. Many workers had shown the intimate relation of some form of streptococcus to several different lesions—such as pericarditis, arthritis, and even chorea, but the large number of negative findings threw doubt on the observations. Treatment by streptococcal vaccines, protein shock, and intravenous flavine seemed to have no great value, though antistreptococcal serum had been used with benefit. According to the definition of allergy used in Great Britain, rheumatism was not an allergic disease. The term, however, as defined for instance by Aschoff, included both reactions to infections and "attack" diseases, the sense in which British writers used the term. There would appear to be no doubt that some factor, so far obscure, which to some was a form of allergy, to others explained by some local or general factor inherited or acquired. It might also be looked on as a tertiary phenomenon of a streptococcal infection on the analogy of syphilis.

Prof. F. KLINGE (Münster) said that, as in later years, rheumatic fever in childhood was definitely a generalised disease, but it attacked principally the locomotor apparatus and internal organs. Visceral rheumatism, a progressive form typical of early years of life, was characterised by remarkably serious and widespread rheumatic damage. Its medical importance lay in the scarring and sclerosis which endured through life.

CLINICAL ASPECT

Dr. LEONARD FINDLAY (London) held the view that the solution of the problem of the disease awaited the discovery of the cause. Without that a specific diagnostic test could not be expected and treatment must perforce be empirical. It was imperative to encourage research into the cause to the full, and he thought it should be limited in the first instance to study of those manifestations about which there was general agreement and probability of relationship. At the present moment the only conditions which could be accepted as probable manifestations of the rheumatic infection were, in order of importance, arthritis, carditis, chorea, the subcutaneous nodule, and erythema circinata. But none of these was pathognomonic and each of them could be, and was with varying frequency, caused by some other infection. A decade ago the tendency had been to treat all indefinite pains as rheumatic, but thanks to experience gained in rheumatic clinics mere debility or some orthopædic lesion was recognised as the usual explanation of the symptom. Such cases if followed up were seldom if ever seen to develop carditis. The selective action of a toxin for a particular tissue was one of the most interesting phenomena in biology; it was remarkable that the pleura, separated from the pericardium by the merest film of areolar tissue and homologous with it, should not invariably suffer when pericarditis was present. Dr. Findlay did not believe that pleural, meningeal, pulmonary, and peritoneal infections ever had a rheumatic basis. In every instance he had investigated the pleural effusion in acute rheumatism had been passive. The presence of an Aschoff nodule had been taken as proof of the rheumatic nature of some cases of pneumonia, but giant-cell formation was characteristic of healing wounds and was not infrequently observed in chronic broncho-pneumonia of childhood. Any naked-eye or histological evidence of peritonitis was restricted to the neighbourhood of the diaphragm in cases of chronic pericarditis and was quite different from a primary and acute infection. In his experience severe abdominal pain in the rheumatic patient had been due to either referred pain from the pericarditis or to an underlying arthritis of the hip, which if right-sided might be mistaken

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for appendicitis. Meningitis as a manifestation was a survival of pre-bacteriology days when suppurative arthritis was taken for acute rheumatic fever. Dr. Findlay did not think that headache and delirium and even some stiffness of the neck warranted a diagnosis of meningitis; this was only justified by some abnormality, other than raised pressure, of the cerebro-spinal fluid. In no recorded case had the findings given proof of meningitis.

Dr. H. GRENET (France) pointed out that the gravity of rheumatic fever was much greater in children than in adults, and he thought this might be due to particularly favourable soil on the one hand or partial immunisation on the other. In France 2–4·5 per cent. of the children admitted to hospital for medical conditions suffered from rheumatism. He had found that the first attack was commonest between the ages of 8 and 14 years, the youngest among his cases being only 2. He had been unable to note any greater liability to infection of one sex. He maintained that the disease might also manifest complications involving lungs, pleuræ, digestive system, and kidneys. Fever was only of secondary importance, the disease being progressive sometimes when the temperature fell. Cardiac lesions were of course most important, occurring in 72 per cent. of his cases and being permanent in 65 per cent. of them. The mortality among all cases in hospital in ten years had been 17·4 per cent., and the prognosis for juvenile rheumatism was on the whole unfavourable.

SOCIAL ASPECT

Dr. F. J. POYNTON (Bath) said that on account of its consequences and its frequency juvenile rheumatism was a serious disease. The Ministry of Health in 1927 had estimated 35,000 children in England and Wales with rheumatic heart disease. The maximum age of incidence was between 7 and 10 years and its frequency under 5 years was underrated in this country; the frequent occurrence under 12 years should, he said, be burnt into the consciousness of all doctors. Although there were no statistics to show the incidence among the well-to-do and poor he held that it was on the whole relatively greater among the poor. It certainly was not confined to those within the complex of poverty, and he concluded therefore that infection and climate played their part. In his figures which had accumulated since last century he had found a definite familial history in 40 per cent. Turning to the conditions which favoured the disease among the poor, he spoke of the damp, overcrowding, mal-sanitation, undernutrition, and other faults which made up their "micro-climate." In Great Britain those interested in every form of rheumatism would never again have such an opportunity of studying micro-climate in relation to juvenile rheumatism, for already over 3 million new houses had been built, and if they were good houses (and if housing was related to the disease) there would be a fall in the incidence. Unfortunately it had been estimated that 10 per cent. of the new houses were bad and 20 per cent. doubtful. He hoped that in the future the special risks of rheumatic children—nervous overstrain, sudden chilling in swimming-pools, overexertion in physical culture, and more especially lack of after-care in convalescence—would receive attention.

Dr. WILFRID SHELDON (London) read a paper on the therapeutic aspect of juvenile rheumatism which appears in full on p. 767.

PARIS

(FROM OUR OWN CORRESPONDENT)

REGULATION OF THE SALE OF FRUIT JUICES

WITH the growing consumption of non-alcoholic beverages made from fruit it has become more and more desirable that legal safeguards should be adopted on behalf of the consumer. The French syndicate formed by the makers of these fruit juices has recently consulted the Academy of Medicine about the framing of such legislation. Discussions within the Academy have done much to clear the air and guide the prospective legislator in this matter. It was generally agreed that no chemicals, but only such physical means as pasteurisation, refrigeration, filtration, &c., should be employed for the preservation of these drinks. It was held that even apparently harmless additions like colouring agents and perfumes should be taboo. On the other hand sugar in the form of saccharose may be added to correct excessive acidity and any tannin there might be present. Other recommendations, endorsed by the Academy, concerned nomenclature when the juice of more than one fruit is sold in the same bottle or when the juice has been in some way or other concentrated and "reconstituted." Vendors should also put a label on every bottle telling the consumer to empty it there and then. What was, perhaps, the most important expression of opinion in this connexion was the hearty damnation of any kind of chemical preservative, even the sulphur compounds hitherto presumed to be guileless.

HEALTH PASSPORTS

What may prove to be the thin end of a wedge driving the health passport into the community as a whole is a system recently adopted on behalf of delinquent children given the hospitality of certain correctional institutions. According to this system, a record is to be compiled for each of these children, giving the pertinent facts about delinquencies, family antecedents, the findings of physical and mental examinations, pathological "incidents," and professional aptitudes with a view to future employment. The compilation of this record is to be continued till the child attains his majority. It is expected that this system will soon be extended to all the children in the care of charitable and similar organisations. This is not all. For at the Ministry of Public Health a committee is studying the conditions under which it may be possible to introduce for all, and in the interest of all, the health passport for which the Louise Hervieu Association has agitated for some time. After all, why not? Having resigned ourselves to giving the often impertinent information we have had to part with in the quest for an ordinary passport, why not submit to supplying information that may prove invaluable to the doctors who are new to us and whose aid we wish to invoke?

THE FALLING BIRTH-RATE

Dr. Boverat, president of the Alliance Nationale Contre la Dépopulation, has recently pointed out that in 1937 there were less than 620,000 live births, whereas in 1876 there were 1,022,000. This decline has assumed Gadarene violence during the past six years in which the annual birth-rate has declined by more than 120,000. At the present time only 870 girls are born to every 1000 women—a deficit of 13 per cent.; Paris by itself is still more sterile, with only 500 per 1000 women. If the rhythm of the last

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few years is maintained in the years to come, there will be 100,000 fewer births five years hence than there are at present. For the past three years France has been among those countries whose birth-rate is below their death-rate. Meanwhile, with the increase in the average expectation of life, the numbers of the aged will continue to grow for the next thirty years at least. The armaments race between the nations, so noisily advertised, may in the end prove a much less serious matter than the stealthy birth-rate race in which France is being hopelessly outdistanced by Germany and Italy.

UNITED STATES OF AMERICA

(FROM OUR OWN CORRESPONDENT)

SYPHILIS LEGISLATION

IN my letter published in your issue of Jan. 22nd I referred to pending Bills in the New York legislature. Both of the Bills referred to have now passed the legislature and the Bill requiring blood tests during pregnancy or at delivery was signed by Governor Lehman yesterday (March 18th) in the presence of the health commissioner of New York City, the deputy health commissioner of New York State, Dr. Walter Clarke representing the American Social Hygiene Association, Dr. Emily Barringer, president of the New York Women's Medical Association, and others. Originally the Bill required that the result of the blood test must appear on the birth certificate. This provision was stricken by the Assembly with the concurrence of the senate. The Act now requires that the certificate should state whether the test was made and if not, why not.

Although this Bill embodied legislation which has never before been contemplated in America, its passage was never in doubt. It was supported by numerous medical and welfare organisations as well as by the official health departments of State and city. The companion Bill requiring serological tests and a medical examination for syphilis before marriage met, on the other hand, with opposition and its fate was considered highly doubtful. However, within a few hours of the signing of the one Act this second Bill passed the Assembly with a majority of 98 to 38 and has gone to the Governor for signature.

A.M.A. POLICY

In my letter published on Feb. 5th under the above title, I quoted a resolution of the American Medical Association trustees on medical care and a projected conference of the trustees with the committee of physicians advancing principles and proposals for the improvement of medical care. The sequel to both of these developments is published in the *Journal* of the Association for March 5th and 12th. On p. 127B are published the official suggestions for the conduct of a study of medical care. The suggestions are heavily freighted with suspicion that "statements have been circulated by certain individuals and interests hostile toward the medical profession to create the general belief that medical services and facilities are grossly insufficient and intentionally difficult to obtain." The investigators are thus indirectly urged to prove that services and facilities are not grossly insufficient. It is to be feared that the survey may result in a brief for the sufficiency of the present services rather than an investigation of the present need for better medical care. Also it is not quite clear how the profession is to estimate the number of persons who need medical care but who do not ask for it. I have to admit that forms have been sent to county medical societies which I have not yet seen.

On p. 149B of the March 12th issue is reported a meeting of the trustees with the committee of physicians. The trustees agreed "that there should be more discussion in the *Journal* of social and economic problems concerning the provision of medical care with the presentation of various aspects of the subject." This agreement must be read in conjunction with a statement signed by the secretary of the committee and published on p. 141B. It is hailed by the New York *Post* as "a great victory for the liberals in organized medicine." The New York *Times* more cautiously says that a notable victory has been won "if a physician may now count within reason on the publication of his disagreement with the *Journal's* views." This remains to be seen.

OBITUARY

WE have to record the death of Dr. THOMAS ROSE on March 21st at his old hospital, the Middlesex. He qualified as M.R.C.S. in 1902, later gaining the Hetley clinical prize, and after serving as house physician and house surgeon went to the Chelsea Hospital for Women as resident medical officer, and became a fellow of the Obstetrical Society. His life was to be given to general practice, however, and most of it was spent in Bloomsbury. He early became a police surgeon, and was perhaps best known as surgeon to several West End police stations. But his chief work lay in his own practice, in which he proved himself capable and resourceful—as many of his own profession can testify, for he attended the families of many of them. A Yorkshireman, of slow speech but humorous, he seemed as tireless as he was kind, and he was always ready to help a friend or patient. When he retired a few years ago to the Scottish city of Dunblane his qualities were soon recognised, and he was able to take an active part in public work. He had been re-elected provost shortly before the onset of the illness from which he died, in his 67th year.

Surgeon Rear-Admiral DONALD TEMPLETON HOSKYN, who died on March 28th at Exminster, was the son of Captain Richard Hoskyn, R.N. Born at Kingstown, co. Dublin, in 1857, he studied at University College, London, where he was awarded the gold medal in physiology and later was ophthalmic assistant in the hospital. Having qualified L.S.A. in 1879 and M.B. Lond. four years later, he entered the Navy and was surgeon of the *Curaçoa* on the Australian station in 1894, when he received the thanks of King Malietoa and the Samoan government. In 1910–12 he was deputy surgeon-general at Haslar, then P.M.O. at Hong-Kong until 1916, when he was transferred to take charge of the R.N. Hospital at Chatham, and then became D.C.M.S., Bristol area, of the Ministry of Pensions. He retired from the Navy with the rank of surgeon rear-admiral. He had lately been living at Ashbrittle, near Wellington, Somerset.

SAVE THE CHILDREN FUND.—The panel of honorary medical advisers of this fund has been enlarged and now consists of the following members: Sir Francis Fremantle, Dame Louise McIlroy, Dr. Eric Pritchard, and Dr. Matthew Ray. Mrs. Susan Isaacs, D.Sc., the psychologist, has become associated with the fund as a vice-president, and Dr. Ray also holds this office.

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GRAINS AND SCRUPLES

Under this heading appear week by week the unfettered thoughts of doctors in various occupations. Each contributor is responsible for the section for a month; his name can be seen later in the half-yearly index

FROM A CONSULTING PHYSICIAN

I

A CONSULTING physician to a hospital has a position of great dignity but of no importance. When I was on the active staff I always tried to be particularly polite to members of the consulting staff on their occasional visits. I thought they were dead without knowing it. Then came the "abhorred shears" and cut me off. Somewhat to my surprise I felt that I was nevertheless still alive; indeed in some respects more so. I had got to regard the life of the hospital, in which more than half my days had been spent, as the very hub of existence. Although there was still not much time to "stand and stare" there was more opportunity of gaining wider impressions of life as a whole. It is one of the many compensations of growing older that in middle age one can watch with increasing interest the spacing out of one's contemporaries at school and college in the race of life. Now I could lean over the rails and look at the race from outside, all passion spent as far as competition goes. Moreover it was a pleasing thought that as no one would now be advantaged by my death, no one would presumably wish for it.

I am not troubled by the painful feeling "If only I had my time over again," and that not because of smug self-satisfaction. Of course I should have preferred to have done many things differently, but should I, given a second chance? That assumes one could use painfully gained experience to avoid similar mistakes. Barrie showed us otherwise in "Dear Brutus." But quite apart from this, do I want to repeat the flea-bitten experiences of an extern midwifery clerk?—which by the way gave me a valuable insight into the lives of the very poor. Do I want again to attend to Saturday night "drunks" in the Casualty Department? The answer is not in doubt. Do I want to undergo again the terrors of examinations? A distinguished professor told me that he often had nightmares of missing a First in his Tripos for 12 years afterwards. That tells its own tale. Do *you* really want to go back?

I shall try to avoid discussing the changes I have seen; we seniors love to do it and when it does not bore our juniors it gives them the impression that we were trained in the dark ages. In the retrospect the span of one's own experience seems astonishingly short; one can be helped to realise its length by measuring an equal span backwards from the same starting-point and seeing what was the state of things then. Taking the date of my birth and sweeping backward thus I find Napoleon I at the height of his power and the battle of Trafalgar yet to be won. I started the study of medicine 49 years ago; an equivalent distance backwards lands us midway between the discoveries of Bright and Addison. Cellular Pathology and the Origin of Species were not due for nearly another twenty years. Another impression derived from this mental exercise is how much more remote things seem which happened before our time than those which have happened in our own lifetime.

* * *

Wordsworth "grew old in an age he condemned" and it has been suggested that we are gently prepared for our exit from this world by the inevitable changes which gradually make us feel less at home in it. I think there is something in this when one finds modern music a choice between discordant cacophony and epileptic negroid croonings, modern sculpture meaningless distortion, modern pictures hideous in colour and design, and modern poetry an unintelligible crossword puzzle. I don't feel at home with stark modern furniture and I don't like its dreary coverings of zig-zags in various drab shades of brown. One is still allowed to admire Mozart and Chippendale, however, even if one must only read Tennyson in secret! When I contrast the magnificent outburst of art in Periclean Athens after the Persian War with the vapourings of modern art since the Great War I am tempted to speculate on the underlying psychological factors. The Greeks were filled with optimism, the present age is sick with apprehension. This may be largely due to that increased awareness which is the note of the twentieth century. Readers of Jane Austen and her contemporaries have often commented how little their books are tinged with the wars and rumours of wars amid which they were produced. How much is this awareness of outside perils maintained through the hour by hour information poured out by the daily press from all over the world? Amid all this disquiet and clamour I turn with relief to the advance of medicine. Despite some disagreeable eddies and unsavoury backwaters, its main stream runs clear and sweeps onward with a gathering impetus. Why therefore do we find ourselves held in lower esteem by the public than ever before? I don't mind Mr. James Douglas calling us "medical imbeciles" because no one ever takes him seriously—not even himself, I suspect. Mr. Cyril Scott presents a more detailed indictment in his "Doctors, Disease and Health," and, asserting that "countless peoples are suffering from the indirect and disastrous results of a misplaced confidence" in our profession, proceeds to inform us that there is only one disease, auto-intoxication combined with starvation of the inorganic salts to be found in vital foods. But in order to understand its various manifestations we must turn to the study of astrology. He knows that heredity plays a negligible part in the forming of types; the stars see to that. Here is the evidence, "My father was a typical Leo native, broad shouldered and exceedingly robust. As Leo governs the heart and back he was subject to occasional attacks of lumbago and eventually died of heart disease." Q.E.D.! Mr. Cyril Scott, happy man, was "born with Virgo rising," thus escaping pains in the back and is thereby endowed with "an especial interest in matters of health and particularly in diet." I should have thought that moonshine was as responsible as the stars for such a mental attitude. Of course he knows the cause of cancer, yet his advice is a little ambiguous; on page 140 he says salt is a factor in its causation but by the time he reaches page 173 he has come to the conclusion that when the body is starved of mineral salts trouble is likely to accrue. I always thought that sodium chloride was a mineral salt and that cancer ranked at least as a "trouble." Chapter 23 is entitled Various forms of Obsession, on which the author should indeed be an authority. Mr. Cyril Scott is a musician, and to-day musicians

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claim that they alone are capable of judging music; evidently they can judge medicine also. My excuse for quoting from this farrago of nonsense is that it has not only been favourably reviewed but is symptomatic of that revolt against reason which is a characteristic of this epoch. There is a craving for magic and authority inherent in us all, particularly when we are ill. The gold-headed cane of the physician of the past became his rod of Æsculapius and when he cast it aside and tried to appeal to rational and scientific procedures he lost a powerful weapon. Primitive man believed that disease and death could only come through external influences, either human or divine, and there is a lot of primitive feeling in us still. With the waning of the nineteenth-century conception of an overruling Providence, human agencies were increasingly held responsible. So naturally the doctor came in for the blame. Some years ago a lady had the pleasure of paying damages to her doctor for alleging that he had murdered her husband. A little reflection would have convinced her that putting it at its lowest there are good and sufficient reasons why a doctor would not murder a patient who was a well-known baronet. That is not the way that practices are built up or maintained. In the grief of her bereavement she reverted to a primitive method of thinking.

Yes—this is an age of unreason. But when I was asked, what did the eighteenth century, the age of reason, do for humanity, I had no answer.

PANEL AND CONTRACT PRACTICE

Facts and Figures for London

IT is a long time since the London insurance committee gave any public account of its doings. The last "annual" report dealt with the year 1926, and the report that has just been issued, although primarily concerned with the year Dec. 31st, 1937, is designed to cover the intervening period and provides material for comparing the position in 1937 with that in 1913 when medical benefit was instituted. In 1913 there were in London 1462 insurance practioners; in 1937 there were 2155, of whom 100 were medical officers of hospitals and the like; during the period the number of persons on their lists had risen from 1·31 to 1·87 millions. In 1937 the average number of persons on a practitioner's list was 866. The insured persons in the county for the first quarter of 1913 numbered 1·53 millions, 1·90 millions on Jan. 1st, 1937, and with the advent of the juveniles next month the number will probably pass the 2 million mark.

Local transfers, that is, where the insured person has not removed beyond the area of practice of his original practitioner, are comparatively few, and even so about a quarter of those who apply for consent to transfer do not take advantage of the permission. The figures are: applications 1·26 per 100 of those on practitioners' lists, transfers 0·99. In addition, 9299 transfers were effected with the consent of both doctors.

The capitation-rate has varied during the 25 years: from 1913 to 1919 it was 7*s*., in 1920 and 1921 11*s*., in 1922 and 1923 9*s*. 6*d*., and from 1924 it has remained at 9*s*. During the early part of the period there was provision for an additional payment when the sum available for the supply of drugs and appliances was not fully expended (the floating sixpence); in 1918 and 1919 additional payments were made by way of war bonus, while from October, 1931, until July, 1935, deductions were made as a special contribution to the Exchequer. The average value of each unit of credit for the years 1913 to 1917 was 6*s*. 6·8744*d*., in 1930 it was 8*s*. 11·3746*d*., in 1935 9*s*. 1·1719*d*., in 1936 9*s*. 2·5254*d*., and in 1937 (this figure has become available since the preparation of the report) 9*s*. 2·7695*d*.

London practitioners make few claims for emergency treatment or administration of anæsthetics. Only 146 claims in respect of treatment in emergencies were submitted in 1937, of which 28 were disallowed or withdrawn. The policy of the panel committee in discouraging claims for the provision of an anæsthetist has met with such success that in the year under review only 44 such claims were submitted, of which 10 were disallowed or withdrawn. Range of service cases numbered 113, 85 being for ophthalmic services, 7 for ultra-violet rays, 4 for infra-red rays, and 16 for miscellaneous services, mostly surgical. One claim only was rejected, the service being intravenous injections for tabes dorsalis; 57 of the 85 ophthalmic claims came from one doctor.

The cost of medicines and appliances for the insured population of London in 1937 amounted to over £303,789, the number of prescriptions priced reaching the record figure of 9,050,324. The increase in the number of persons included in practitioners' lists reduced the average number of prescriptions per person as compared with 1936 from 4·99 to 4·87, and the cost per person from 39·43*d*. to 39·26*d*. The average cost per prescription rose, however, from 7·91*d*. to 8·06*d*.

It is reasonable to assume that the number of consultations, either at home or at the doctor's surgery, approximated to the number of prescriptions issued; we note with satisfaction that the medical service subcommittee had to deal with only 13 complaints during the year, and of these less than half were substantiated. Six effective complaints arising out of 9 million consultations does not suggest much dissatisfaction with the standard of treatment provided.

Thirsty Patients

In the first quarter of last year 139 insured persons in Lancashire each received more than twenty prescriptions from the doctors whom they had chosen to attend them in health and sickness. This is one of the salient facts in a report by a department of the Lancashire insurance committee which is always watched for with interest. It might be felt that so laborious an analysis of insurance prescriptions occupies time which would be better spent otherwise, but against that is to be set the really amazing output of the prescription pricers who can deal accurately with nearly three thousand prescriptions a day, pricing every item to one-tenth of a penny, and this in spite of the fact that the writing in more than a hundred instances was illegible and in many more only intelligible to a trained eye. The average total cost per prescription in the year was 8·32*d*., the average cost per insured person being 43·58*d*., and it seems that in Lancashire during the last twenty years the average number of prescriptions issued per insured person has risen from 2·91 to 5·24. This is a rate of increase much in excess of that for the country as a whole; and even the *Manchester Guardian* with its knowledge of local custom finds it hard to account for.

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CORRESPONDENCE

THE SUBURBAN NEUROSIS

To the Editor of THE LANCET

SIR,—I should like to congratulate Dr. Stephen Taylor on drawing attention to a serious social problem which is so often forgotten or lightly glossed over. I think the root of the problem may be classified as (1) fear of the future, generally arising from financial causes, which could be remedied by a suitable insurance system, (2) lack of communal interests.

Let Mrs. Suburbia go to her nearest town hall and offer her services either as a voluntary worker in a maternity and child welfare centre or as a school manager or in one of the newly developed A.R.P. schemes. There is so much good work to be done in the world which would bring the lady many friends and a new outlook on life. Meeting people much poorer than herself would tend to make her more contented with her lot. Meeting people with physical symptoms worse than she ever dreamt of will tend to stop neurosis.

Lastly, if she does a job on the local A.R.P. it will make her realise the priceless blessings of peace and be contented to rub along with the husband she once chose and would hate to lose in another war. In other words, let her try to attain a bigger and fuller outlook on life. Perhaps then she will appreciate the comforts and security of a suburban villa.

I am, Sir, yours faithfully,

CECIL CHRISTIE,
Chairman of Maternity and Child Welfare,
March 25th. Paddington Borough Council.

To the Editor of THE LANCET

SIR,—I am sorry to see that Dr. Stephen Taylor, after making such a careful and penetrating appraisal of the fate of the suburban married woman, has allowed himself to take up the traditional social position of the psycho-analyst. The futility inherent in the lives of women unable to occupy themselves fruitfully in the present social organism is becoming a little obvious by now. Those without employment or career of their own can hope to find solace and fulfilment in rearing children and managing a home only if freed from the anxiety of financial insufficiency and the ignorance which follows a necessarily incomplete education.

I fail to see the purpose of detailed analyses of the misshapen products of twentieth-century civilisation if they are not coupled with proposals for radical treatment. Dr. Taylor, who solves the problem by advocating petty distractions, is really adopting a reactionary attitude which leaves the causative framework untouched. Let us face the facts. Society, as now constituted, is bound to turn out these unhappy creatures so long as it denies them occupations providing complete satisfaction and a dependable economic background. Palliation has its disadvantages, and not the least of these is that it obscures, perhaps unconsciously, fundamental causes. Is it altogether a coincidence that Dr. Taylor warns us that "the latent feelings and strivings of the new mental slum-dwellers" provide a "hopeful field for the teachers of new, and possibly dangerous, political ideologies"? New, yes; but dangerous to whom?

I am, Sir, yours faithfully,

Exeter-road, N.W., March 28th. DAVID LE VAY.

PAINFUL FEET

To the Editor of THE LANCET

SIR,—May I be permitted to correct a statement in your report of my contribution to the discussion on painful feet at the meeting of the Hunterian Society (p. 727). As reported the impression may be created that chiropodists themselves manipulate feet. I said no such thing, and nothing could do more harm to the cause of chiropody than for this erroneous impression to gain ground. What I said was that the services of the chiropodist are as essential as those of a masseuse in running an orthopædic clinic, indeed they are complementary. The rôle of a masseuse is to restore function by developing muscle power and re-educating normal reflexes which are temporarily in abeyance. Since a painful stimulus, whether due to adhesions or corns, always takes precedence over any other afferent impulse, the masseuse is hampered in her work of re-education until either the adhesions are broken down by manipulation or the corns eradicated by the chiropodist.

I am, Sir, yours faithfully,

Wimpole-street, W., March 27th. C. LAMBRINUDI.

CHEMOTHERAPY OF MENINGITIS

To the Editor of THE LANCET

SIR,—In your leading article of March 26th you say that recovery from streptococcal meningitis has hitherto been "most exceptional," and you quote a description of 13 recoveries among 17 cases as "quite astounding"; the implication being that sulphanilamide treatment has greatly improved the outlook. Actually avoidance of delay is the one factor of importance in the treatment of otitic septic meningitis; this is one condition in which every hour counts. I drew attention to this in 1926 [1] and again in 1931,[2] when I published a series of 12 cases with 8 recoveries, and showed that all 5 treated before the end of the second day from onset recovered, but only 3 out of 7 treated on the third day or later. In 1936 [3] I could record "seven cases treated in less than three days from onset—all recovered; among sixteen treated after that time only four recovered." Cases treated since then have received sulphanilamide [4]; one "under three days" died, while of two "over three days" one died and one recovered—not quite such a good record as before, though of course this has no significance. The details of treatment will necessarily vary with each case. The principles are:

(1) Mastoidectomy (the simple Schwartze operation often suffices), with as complete eradication as possible of infected tissue, and thorough exposure of the adjacent dura mater; all bone is well rubbed with B.I.P.P. and the wound freely drained.

(2) Repeated lumbar puncture, once or even twice daily, drawing off as much fluid as will flow; if a fine needle is used there is no risk in this. Thick pus may require to be aspirated. As an alternative, if the labyrinth is dead, the internal auditory meatus may be opened to afford continuous drainage of the theca. I have on occasion opened the dura of the middle or posterior fossa during the mastoid operation; but there seems to be no special advantage in this, and the loss of cerebro-spinal fluid may be so great (over six pints a day in one case) as to be

[1] *Bristol med.-chir. J.* 1926, 43, 91.
[2] *Practitioner*, 1931, 127, 659.
[3] Hamilton Bailey: Emergency Surgery, Bristol, 1936.
[4] *Bristol med.-chir. J.* 1937, 54, 211.

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dangerous. There is no need for continuous lumbar drainage, which increases nursing difficulties.

(3) Antistreptococcal serum by intramuscular injection, or by the lumbar route, if it is felt that any serum so given will reach the cranial meninges. The introduction of disinfectant drugs directly into the theca seems more likely to cause local damage than to inhibit the meningitis. But I have been accustomed to rely on intravenous colloidal silver (50 c.cm. daily), and since the introduction of sulphanilamide have employed this substance also by mouth or intramuscularly in full doses: hexamine has not in my experience proved helpful.

The figures I have quoted show that streptococcal meningitis secondary to ear disease has a high mortality only in the cases in which treatment has been delayed. While recognising the value of sulphanilamide, I would emphasise the supreme importance of immediate and thorough surgical treatment.

I am, Sir, yours faithfully,

Bristol, March 26th. E. WATSON-WILLIAMS.

THE WEEK-END HABIT AMONG DOCTORS

To the Editor of THE LANCET

SIR,—Medical practitioners will read with surprise the extraordinary accusation by Sir Ernest Goodhart in your issue of March 19th. He suggests that doctors take too many week-ends away from their work.

If his letter is intended to be taken seriously one wonders if he has been singularly unfortunate in his personal experiences with the profession; but his remarks only serve to show the danger of airy generalisations. I have been in general practice for over twelve years and, apart from summer holidays, I do not think that on an average I have had more than two week-ends away per year. None of my colleagues in the district are in the habit of taking frequent week-ends off. Evidently I live in a quite abnormal area.

I believe that the truth is diametrically opposite to Sir Ernest Goodhart's notion. It would surely be in the best interests of their patients if doctors *were* able to take more week-ends away and were able to return refreshed and better able to do justice to their work.

In conclusion, I may add that many doctors will be interested to know where practices exist where the doctors are able to develop this "week-end habit." I am, Sir, yours faithfully,

JOHN LANGFORD.

Wellesley-road, W., March 28th.

OUR COLLEAGUES IN AUSTRIA

To the Editor of THE LANCET

SIR,—The alarm expressed in the letter under this heading in your last issue cannot fail to impress when one reads the names of the signatories; yet one cannot help wondering whether it is, after all, well founded.

It is, perhaps, not fully realised that the Jewish Board of Control is well able to look after the interests of Jews in this country and of those coming into this country from abroad, whether they are members of the medical profession or not. A very large sum of money was raised in this country not many years ago by Jewish people for assisting members of the Jewish race who had been forced to leave Germany, and there is no reason to doubt that they will do the same again now if it should become necessary.

What *does* concern members of the British medical profession is the possibility of a further accession of medical refugees from Central Europe. These, if they are allowed to enter—and there is no reason to suppose that the Home Office will act differently in their case—will presumably be allowed to enter our medical schools, as before, in order that they may qualify to practise in this country, as before. Although it was understood by many of us that permission to remain and practise in this country would be granted to a very insignificant number the cold fact remains that large numbers *are* in practice, with a decided advantage over our own recently qualified men and women in that they are men of previous experience in practice. To the latter is added the distinction of being "continental" practitioners, in the eyes of the British public a mark of distinction that places them at once in a higher category than ourselves.

If it is the aim of the signatories to the letter to welcome with open hands any medical refugees from Central Europe to practise and gain their living here, then to be consistent they must at the same time agitate for one of two measures to be adopted. Either we must reduce the numbers of our own medical students (we have approximately 1 practitioner to every 1000 of population at present) in order to prevent the medical profession becoming overstocked, or they must approach the Home Office with a view to sufficient numbers of non-medical refugees being admitted to this country to provide practice and a means of living for the medical refugees.

I am, Sir, yours faithfully,

AUBREY GOODWIN.

Queen Anne-street, W., March 29th.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED MARCH 19TH, 1938

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 2307; diphtheria, 1556; enteric fever, 17 (23 "expected"); pneumonia (primary or influenzal), 1409; puerperal pyrexia, 200; cerebro-spinal fever, 41; acute poliomyelitis, 5; acute polio-encephalitis, 1; encephalitis lethargica, 4; dysentery, 125; ophthalmia neonatorum, 118. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on March 25th was 5756, which included: Scarlet fever, 844; diphtheria, 1182 (carriers 42); measles, 2284; whooping-cough, 312; puerperal fever, 19 mothers (plus 13 babies); encephalitis lethargica, 282; poliomyelitis, 0. At St. Margaret's Hospital there were 32 babies (plus 16 mothers) with ophthalmia neonatorum.

Deaths.—In 125 great towns, including London, there was no death from small-pox or enteric fever, 66 (18) from measles, 8 (3) from scarlet fever, 16 (3) from whooping-cough, 41 (5) from diphtheria, 50 (15) from diarrhœa and enteritis under two years, and 76 (5) from influenza. The figures in parentheses are those for London itself.

Measles was fatal in 29 great towns: Manchester and Plymouth each had 6 fatal cases, Wimbledon and Liverpool each 3, no other great town more than 2. Diphtheria was fatal in 27 great towns, Manchester and Birmingham each reporting 3 deaths. Thirteen fatal cases of influenza were reported from Birmingham, 4 from Manchester.

The number of stillbirths notified during the week was 249 (corresponding to a rate of 34 per 1000 total births), including 35 in London.

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PUBLIC HEALTH

Croydon's Obstetric Service

AN appendix to a clinical report on Croydon's obstetric service for 1936 compiled by Dr. R. F. Thomas, full-time assistant medical officer for obstetrics and gynæcology, describes in some detail the obstetric scheme of the borough. This scheme "aims at the ideal of complete antenatal and postnatal medical supervision under the same whole-time medical officer." There is no extern midwifery scheme conducted by the council, and 32 of the 74 maternity beds are in St. Mary's Maternity Hospital, where the patients are attended by a rota of six local practitioners. All these patients, and a proportion of the midwives' cases are, however, seen by Dr. Thomas at the council's antenatal and postnatal clinics, where he has the help of a woman assistant medical officer of health. The obstetrician is also available for consultation by practitioners about cases under their care delivered at home, when the patient cannot afford a private consultant; 28 such patients were examined by him in 1936. He is in charge of the puerperal infection unit at the Borough Hospital and of 36 antenatal, postnatal, and gynæcological beds at that hospital.

The report covers 1500 cases, attended in the obstetric department of the Mayday-road Hospital, in St. Mary's Maternity Hospital, and in the puerperal infection unit. This represents 42 per cent. of the births in the area. They have been divided into booked and emergency cases, and extensive tables, arranged in the form recommended by the section of obstetrics and gynæcology of the Royal Society of Medicine, emphasise particularly the value of antenatal supervision. There were two maternal deaths in the 1257 booked cases, and six deaths in the 192 emergency cases (excluding four deaths of patients admitted after the onset of pyrexia).

Much has been written about team-work in obstetrics, and the necessity for coöperation between the different units of a maternity service. This scheme requires a high order of coöperation and coördination for its successful working, and Croydon deserves congratulation on having implemented it with such satisfactory results.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS

Food and Drugs Bill

IN moving the second reading of the Food and Drugs Bill in the House of Lords on March 24th Viscount GAGE said that the Bill represented the third of a series of measures dealing with local government and public health based on the work of a Departmental Committee appointed in 1929, the two previous measures being the Local Government Act 1933, and the Public Health Act 1936. Part I of the present Bill contained general provisions as to food and drugs and dealt with the seizure and condemnation of unsound food. It also contained the very important power to make regulations with regard to the importation, preparation, storage, sale and delivery of food which are now conferred on the Minister of Health by the Public Health (Regulations as to Food) Act 1907. Part II dealt with milk, dairies, and artificial cream, and Part III with certain other foods, the most important being bread and flour. The existing law relating to bread and flour dated back to the Bread Acts of 1822 and 1836. Those Acts were now obsolete, both in form and substance, and the question of their supersession had for some time been under consideration. Part IV reproduced provisions in the Adulteration Act of 1928 relating to importation offences, and Part V dealt with the operation by local authorities of markets, slaughter-houses, and cold-air stores. As in the case of the Public Health Act 1936, a great simplification and shortening of the law would be effected by the Bill. Its aim was not to lay down a perfect code of law, which would involve some matters of acute controversy, but rather to gather together in intelligible shape the law relating to food and drugs and thereby to provide a firm foundation for future legislation. Lord MANCROFT said that there ought to be in this Bill some provision to protect bread and other foods against insanitary handling in delivery. It should also give power to local authorities to prevent shopkeepers exhibiting vegetables which were to be sold for food in any place or receptacle on the level of the pavement. It was necessary to teach the people that milk and bread and vegetables which were produced pure should be kept free from contamination after they had been dispatched for delivery.

Lord ADDINGTON, speaking as chairman of the Departmental Committee which drafted the Bill, said that there were a large number of matters on which the Minister might make regulations—milk and dairy regulations for example—and those included the distribution of milk, the sealing or closing of churns and other vessels, the display of the vendor's name and address, and the abstraction of fats. They had gone as far as they could, consistently with the present law, in that direction. This Bill allowed regulations to be made for preventing danger to health from the importation, preparation, transport, storage, exposure for sale and delivery of bread or flour, and laid down very clearly that it was the duty of the Food and Drugs authority to enforce and carry out these specific regulations. Lord STRABOLGI said all this was permissive; there was nothing mandatory about it in nearly every case. The method of delivering bread in this country was absolutely uncivilised; all bread ought to be wrapped, as it was in the United States. The Bill was referred to a joint committee of both Houses of Parliament for detailed examination.

Unemployment Benefit Changes

In the House of Commons on March 25th Mr. E. BROWN, Minister of Labour, said that at the end of December, 1937, the general account of the Unemployment Fund had a balance of £60,379,000. The statutory committee considered it would be prudent to hold a portion of each annual balance as a reserve, and this had been previously agreed to by the House of Commons. They should do nothing in the administration of the Fund which would need undoing in the years ahead, even though the circumstances of unemployment were adverse. Certain improvements were estimated by the committee to cost £15,366,000 and provision for a reserve and the financing of improvements already decided upon made this up to £52,900,000. That left a certain disposable surplus. The committee recommended increasing the rates for adult dependants, including wives, from 9*s*. to 10*s*. and making an alteration regarding the additional days of benefit in favour of the man with a good record of five years' contributions. The altered ratio would mean seven weeks more benefit payable to those who had the necessary contributions. With regard to agricultural workers

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the balance on Dec. 31st was £1,825,000, which included £647,000 balance at the end of 1936. A prudent view was particularly needed in that case because of the small experience of the working of the scheme. The committee recommended the reduction of the waiting period from six days to three at a cost of £50,000 per annum, the reduction of the rate of contributions by ½d. for each party, and an increase of the weekly rate of benefit to men between the ages of 18 and 21 from 10s. to 12s. These changes would make the income of the Fund £180,000 a year less and would increase expenditure by £42,500.

In the House of Lords on March 29th the Royal Sheffield Infirmary and Hospital Bill was read the third time and passed.—The Housing (Financial Provisions) Bill was read the third time and passed.

QUESTION TIME

WEDNESDAY, MARCH 23RD

Cod-liver Oil Imports

Mr. ROBERT GIBSON asked the President of the Board of Trade what were the imports of cod-liver oil from Newfoundland in 1929 and 1937, respectively, and the production of the said oil in the United Kingdom in the same years; and what were the average prices of the said oil in those years.—Captain WALLACE, Parliamentary Secretary to the Board of Trade, replied: Total imports into the United Kingdom of cod-liver oil consigned from Newfoundland (including the coast of Labrador) amounted to 519 tons in 1929 and to 871 tons in 1937; the bulk of these imports consisted of unrefined oil used for industrial purposes. Particulars of United Kingdom production in these years are not available but it is known to have increased substantially. For Newfoundland oil, I have no detailed price information for the years in question, but finest Lofoten steam-refined non-freezing medicinal cod-liver oil is quoted regularly in the *Chemist and Druggist*, and for that description the price averaged about 110 shillings per barrel, c.i.f. London, in 1929 and 98·75 shillings in 1937.

Extent of Public Assistance

Mr. GORDON MACDONALD asked the Minister of Health the number of persons in receipt of public assistance in July, 1931, and on the latest date on which figures are available, giving separate figures for Lancashire.—Mr. BERNAYS, Parliamentary Secretary to the Ministry of Health, replied: On the last Saturday in July, 1931, the number for England and Wales, excluding rate-aided patients in mental hospitals, persons in receipt of domiciliary medical relief only, and casuals, was 972,909. The corresponding number on Saturday, March 5th, 1938, the latest date for which figures are available, was 1,072,191. The figures for the administrative county of Lancaster together with the 17 associated county boroughs were 140,561 and 176,623 respectively.

THURSDAY, MARCH 24TH

Feeding of Necessitous Children

Mr. GEORGE GRIFFITHS asked the Parliamentary Secretary to the Board of Education the number of local education authorities who had laid down income scales in connexion with the feeding of necessitous children; and if it was the Board's intention that where the family income fell below the standard of minimum physiological needs a child should only be fed when or so long as he showed definite physical or educational signs of malnutrition.—Mr. KENNETH LINDSAY replied: 230 local education authorities have laid down income scales in connexion with the feeding of necessitous children. The method of selection for free meals or milk is explained in the Board's Circular 1443, of which I am sending a copy to the hon. Member. It is not necessary that children should show definite signs of malnutrition before they can be fed free. Provision may properly be made for any child who shows any symptoms, educational or physical, however slight, of inability by reason of lack of food to take full advantage of the education provided for him.—Mr. GRIFFITHS: If the child's health has improved will the free meals be stopped, or will they continue as long as the family income is below the scale?—Mr. LINDSAY: No, not necessarily.

School-children Needing Footwear

Mr. TOMLINSON asked the Parliamentary Secretary to the Board of Education whether, in view of the fact that the Unemployment Assistance Board had refused 70 per cent. of the applications made to them for the provision of footwear for necessitous school-children during the past month in the Lancashire county area, he would consider the advisability of granting the facilities for the making of this provision to the local education authorities.—Mr. KENNETH LINDSAY: I am not at present in a position to confirm the facts stated by the hon. Member, but I am communicating with the Unemployment Assistance Board and will let the hon. Member know the result in due course.—Mr. TOMLINSON: Can the Parliamentary Secretary inform the House why the President constantly withholds the power from local education authorities to carry out this work?—Mr. LINDSAY: As the hon. Member knows perfectly well it would involve legislation, but I should be glad to inquire into specific facts.

Treatment of Rheumatism

Mr. DAY asked the Minister of Health whether, in view of the loss of national efficiency and the suffering experienced by persons due to the incidence of rheumatic complaints, he would set up a committee to consider the best methods of the treatment of rheumatism and the provision of facilities for that treatment.—Sir KINGSLEY WOOD replied: Work in this connexion is already being undertaken by the Empire Rheumatism Council in coöperation with a special committee of the Royal College of Physicians. The Medical Research Council also encourages and assists research in the various aspects of this disease.—Mr. DAY: Can the right hon. gentleman say whether any Government grant will be made towards those who are undergoing this treatment?—Mr. A. JENKINS: Is the right hon. gentleman aware that there are many thousands of people suffering from this complaint who are not able to get proper and adequate treatment, and will he take immediate steps either by setting up a committee or by the alteration of the National Health Insurance Acts, in order to see that people may get adequate treatment?—Sir K. WOOD: That is another matter.

Extension of Attested Herds Scheme

Mr. PRICE asked the Minister of Agriculture if any assistance would be given to owners of beef cattle in connexion with the scheme for eradicating tuberculosis from the herds; what form that assistance would take; and the date on which it would come into operation.—Mr. MORRISON replied: Under the powers conferred by Section 20 of the Agriculture Act, 1937, it is proposed to extend the present Attested Herds Scheme as soon as practicable to enable payments to be made in respect of herds maintained primarily for beef production. I am not yet in a position to announce the form that assistance will take or the date on which the arrangements will operate, but I hope to be able to make a statement on the subject at an early date.

Nutritive Value of Skimmed Milk

Viscountess ASTOR asked the Minister of Agriculture if he was aware that the Food Council in its recent report condemned the waste of 6½ million gallons of skimmed milk; and, in view of the stress laid upon its value as a nutritive food by the advisory committee on nutrition, what action was he contemplating to avoid this waste in future.—Mr. MORRISON replied: I am aware of the statement to which the Noble Lady refers, although the estimate of gallonage should, in my opinion, be accepted with reserve. The supply of skimmed milk is inconstant, since it depends upon the varying quantities of whole milk available for manufacture into butter and cream, and it is in greatest supply when the overflow of whole milk from the liquid market is largest. Moreover, many manufacturers have no facilities for converting skimmed

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milk into a product which can be conveniently stored, handled, and transported. Even those manufacturers who are so equipped have difficulty on occasions in finding outlets for all the skimmed milk left from their manufacturing operations, and, for the others, the problem is largely one of finding a steady sale for a highly fluctuating quantity and no satisfactory solution has yet been found.

Viscountess ASTOR: Is it not the case that the Milk Marketing Board refuse to allow this skimmed milk to be sold? That is their policy. Are they not thereby depriving thousands of children and other people of the benefit of this skimmed milk?—Mr. MORRISON: That is not quite true. The Milk Marketing Board do not pay rebates on skimmed milk when sold by the purchaser for liquid consumption, as the purchaser would give almost as much for skimmed milk as for whole milk and the Board would thereby be subsidising the sale of skimmed milk to the detriment of their own producers. What we want is that people should drink whole milk and not skimmed milk.

MONDAY, MARCH 28TH

Telephone Mouthpieces and Infection

Commander OLIVER LOCKER-LAMPSON asked the Postmaster-General whether, in view of the fact that it was recognised by competent medical authorities that the mouthpieces of public telephone instruments when unattended by officials to cleanse them were carriers of germs, he would introduce a system whereby unattended public telephones were sterilised regularly so as to ensure that users thereof were not exposed to contagion.—Major TRYON replied: I am advised on responsible medical authority and as the result of extensive investigations in this country and abroad that the risk of infection from the use of telephones is negligible. Nevertheless I can assure my hon. friend that the regulations already provide for mouthpieces and receivers in public call offices to be cleaned with disinfectant at frequent intervals; in urban areas this process is carried out each week-day.

Detention Under the Mental Deficiency Act

Mr. LOGAN asked the Minister of Health if his attention had been called to the case of William Hargreaves, 31 years old, married, Territorial, who was arrested at the Ministry of Labour office, Bootle, by two plain-clothes officers, who informed him they had orders to detain him until an escort arrived from the asylum in which he had been incarcerated 14 years ago, on the grounds that Hargreaves had not been subject and amenable to proper supervision during the 12 years he had been at liberty; and what steps he was taking to have this case reviewed with a view to releasing Hargreaves.—Mr. BERNAYS replied: My right hon. friend has caused inquiry to be made in the case of William Hargreaves. He was sent to an institution for mental defectives on July 10th, 1925, on the authority of an order made under the Mental Deficiency Act, 1913. He was allowed to leave the institution on licence on Dec. 22nd, 1926. The periods were extended from time to time until May 11th, 1934, when the licence was revoked on the ground that its conditions had been broken. The patient was then treated as an escape from licence and was eventually brought back to the institution on Feb. 3rd, 1938. He was again allowed to leave the institution on licence on March 9th. The Board of Control have reviewed the whole of the circumstances of the case, and as a result have directed William Hargreaves's discharge from the order under the Mental Deficiency Acts made in respect of him.

Mr. LOGAN: Is it not a fact that William Hargreaves has been sane all along; that he was released last week simply and solely because of the question being raised in the House, the examination having taken place only during the week; further, is it not a fact that this man has been away from an institution for 12 years, and that he is considered to be mentally sound, and that the Territorial officers under whom he has been working say that he is perfectly sane; and will the Minister say what inquiry, if any, he intends to make if a man is considered to be insane, sent to an asylum, and treated as a convict, and what compensation he intends to pay?—Mr. BERNAYS: Special reports were made in August last year about the case of Mr. Hargreaves and the specialists came to the conclusion that he was not a proper person to be detained in an asylum. It was within the discretion of the Board to accept that recommendation or not, and in fact they did not act upon it.—Mr. LOGAN: In view of the outrage upon public liberty, I intend to raise this question on the adjournment.

TUESDAY, MARCH 29TH

Medical Referees and Workmen's Compensation

Mr. TINKER asked the Home Secretary if he was aware that the present method of medical referees under the Workmen's Compensation Act did not give satisfaction to the injured workmen, and that a change was suggested in the report of the departmental committee set up to inquire into the Workmen's Compensation Act; when he intended to announce the conclusions of the Government on this report; and if he proposed to consult the House prior to arriving at these conclusions.—Sir SAMUEL HOARE replied: The committee's recommendations involve important changes in the present system which could not be carried out without legislation, and I cannot foresee sufficient time this session for legislation of this character. In any case it would, I consider, be an advantage to allow more time, not only for the Government but also for industry and for Members of Parliament, to consider the recommendations of the committee before legislation is formulated, and I shall be glad to receive and consider any representations which hon. Members may wish to make on particular points.

THE LANCET 100 YEARS AGO

March 31st, 1838, p. 21.

From a leading article on the diet provided in Dudley workhouse.

. . . When this matter was discussed, recently, in the House of Lords, the opinion of a physician was cited on the subject of the dietary; and Lord MELBOURNE met the arguments of the Bishop of EXETER by a denunciation, not only of this opinion in particular, but of medical opinions generally:—

> "With respect to the case of Dudley itself," his lordship said, "he was not prepared to go into a discussion of it. Thus much, however, he must say, that he had no great opinion of the views of medical men on a subject of this kind; their sentiments on a question of this nature were, in his judgment, the worst that could be attended to. A medical man was more conversant with a fit and proper diet for sick persons than for those who were in health, and everybody knew that even with reference to that, medical men differed very widely in their views and opinions, and in his (Viscount Melbourne's) judgment the best test for such a dietary was the test of experience."

If Lord MELBOURNE had said that the opinions of military or naval men in professional matters were contradictory, and of no value,—if he had used the same language with reference to lawyers, or parsons, twenty noble lords would have been on their legs in a moment to protest against the gratuitous attack. The Premier's sarcasm in the present case was unprovoked, and sure to meet with no retort; but was the statement just? CERVANTES narrates a story in which the governor of a certain island, seated at the dinner table, was highly incensed with one Dr. PEDRO POSITIVE, who waved a white wand, and motioned away every delicacy which his Excellency selected. Governor PANZA consigned the doctor forthwith to a dungeon, and addressed him (not his profession) in unmeasured terms of condemnation as a conspirator against his life. It is easy to conceive a Prime Minister under such circumstances, hard pressed and mortified, giving vent to the taunt ascribed to Lord MELBOURNE. But no doctor in the House of Lords attempted to place a restraint on the indulgence of the Premier's appetite, or to say that he should not have any morceau that he might fancy, from a truffle to a *rognon broché*. The only declaration made was, that the poor men in the workhouse of Dudley were not allowed sufficient food to sustain health,—a humane and timely announcement.

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MEDICAL NEWS

University of Cambridge

The university has accepted the offer of the Rockefeller Foundation to provide £8000 towards the support of research in the department of medicine over the period from 1938 to 1942. In any one year the grant is not to exceed £1600. It has been decided to use the money to establish three posts of assistant in research in medicine for this period and the appointments will be made from July 1st.

University of London

Dr. R. V. Christie, assistant director of the medical unit and assistant physician at the London Hospital, has been appointed to the university chair of medicine tenable at St. Bartholomew's Hospital medical college.

Dr. Christie is 35 years of age. He was educated in China and at George Watson's College, Edinburgh. He graduated M.B. at the University of Edinburgh in 1925 and last year he was awarded the gold medal by the university for his M.D. thesis. After holding house appointments at the Royal Infirmary he went to New York in 1926 as assistant to the department of applied physiology in the Rockefeller Institute for Medical Research, and in 1927 he received the Gunning Victoria Jubilee prize for his investigations there. In 1928 he became senior resident medical officer in the Royal Victoria Hospital in Montreal. In 1929 as holder of the Travers Allan scholarship he was granted leave of absence, and he went to Freiburg as assistant in the department of pathology. Later he visited other universities in Germany and Belgium. When Dr. Christie returned to Montreal he was appointed research associate in the McGill University Clinic of the Royal Victoria Hospital. In 1932 he was elected to the American Society for Clinical Investigation and in 1933 he was awarded the degree of M.Sc. of McGill University. He took up his present post in 1935. He contributed the article on dyspnœa and emphysema to the British Encyclopædia of Medical Practice, and his other published work includes papers on lung volume and its subdivisions, and the elastic properties of the emphysematous lung.

Dr. F. R. Winton has been appointed to the university chair of pharmacology tenable at University College. Since 1933 he has been reader in physiology in the University of Cambridge.

Dr. Winton, who is 43, was educated at Oundle School and at Clare College, Cambridge, where he obtained a major scholarship in natural sciences and mathematics in 1912 and a foundation scholarship in 1915. He obtained a first class in part I of the natural sciences tripos in 1915 and after a period as research chemist at the Mond Nickel Company studied medicine first at Bart.'s and later at University College Hospital, graduating in 1923. From 1924 to 1927 he was a demonstrator in the department of pharmacology at University College and during this time he obtained his M.D. Camb. From 1927–31 while holding a junior Beit fellowship and later a "fourth year" Beit fellowship he acted as part-time lecturer in the department of physiology at the College. He was awarded a senior Beit fellowship in 1931 which he resigned when he was appointed lecturer in physiology in the University of Cambridge. In 1933 he took up his present post. He has published "Introduction to Comparative Physiology" with L. T. Hogben and "Human Physiology" with L. E. Bayliss.

Hunterian Society

A gold medal is awarded annually by this society for the best essay written by a general practitioner. The subject for 1938 is the management of inoperable malignant disease in general practice, and for 1939 the treatment of obesity in general practice. The medal for 1937 was awarded to Dr. J. Wilson Reid of Anglesey for his essay on the prognosis and care of heart disease in general practice. Any registered practitioner resident within the British Empire is eligible. A copy of the rules may be had from Mr. A. E. Porritt, 27, Harley-street, W.1.

Oxford Ophthalmological Congress

The twenty-seventh annual meeting will be held at Keble College from July 6th to 9th. Dr. Bernard Chavasse and a neurologist will open the first discussion, on the ætiology, diagnosis, and treatment of ocular palsies, and the Doyne memorial lecture will be delivered by Prof. A. von Szily, formerly director of the university ophthalmological clinic at Münster. He will speak on the contribution of pathological examinations to the elucidation of the problems of cataract. Papers will also be given by Prof. Hans Lauber (Warsaw), Dr. H. M. Traquair (Edinburgh), Dr. Bernard Samuels (New York), Dr. J. A. van Heuven (Utrecht), and Dr. Czukrasz Ida (Debreçen). Further information may be had from the hon. secretary, Dr. F. A. Anderson, 12, St. John's-hill, Shrewsbury.

University of Leeds

At recent examinations the following candidates were successful:—

M.D.

Doris B. Brown, D. Heap, E. James, and E. J. Wayne.

CH.M.

M. B. Khan.

FINAL EXAMINATION FOR M.B., CH.B.

Part I.—A. N. T. Aikman, T. Akroyd, J. B. Ashmore, C. E. Astley, P. D. Bedford, C. H. Boyd, A. Colbert, J. B. Coltman, E. Cope, Patricia M. Dobinson, Ruth Edmonds, G. Farrer, J. M. Fitton, M. M. Frais, M. Goldberg, H. Goldstone, Mary E. Goodson, F. Gouldsborough, A. Green, G. Higgins, J. Hirst, H. J. M. Holland, Adelaide J. G. James, F. Jennings, R. E. Johnson, D. E. Mitchell, L. H. Moss, C. Pickard, J. D. Pickup, T. B. Purdy, P. Rapaport, G. N. Reed, L. Rosenthal, F. Sandy, J. F. Scannell, J. V. Schofield, F. N. Shuttleworth, Ida M. Shuttleworth, S. A. Smith, S. A. Swanson, E. S. Tan, P. E. R. Tattersall, A. L. Taylor, P. J. Waddington, R. P. Warin, K. D. Wood, and I. Young.

Parts II and III.—W. M. H. Shaw (first-class honours); J. K. Drucquer, E. W. Jackson, W. R. Jackson, and R. Orton (second-class honours); G. R. Bedford, D. Benson, J. Braham, W. A. Bridgwood, W. L. Carruthers, D. B. Feather, Dorothy Haigh, R. A. S. Keighley, E. S. Levy, S. Madden, W. Maude, R. B. Raj, G. F. Reid, Phyllis M. Richards, J. F. Robinson, J. W. Scholey, S. H. Segerman, A. P. B. Waind, A. J. Ward, T. I. Watkins, D. C. Williams, and Kathleen Wilson.

B.CH.D.

Dorothy M. Bateman (second-class honours).

L.D.S.

F. B. Copeland, J. Dawson, C. G. Dodd, G. B. Hopkin, F. G. Rushworth, S. A. Thornton, Jean Townend, D. J. Watson, and N. P. Williamson.

D.P.M.

W. Sharp.

D.P.H.

W. Hobson and R. S. Illingworth (with distinction); and T. W. Smailes.

British College of Obstetricians and Gynæcologists

The following candidates have satisfied the examiners and have been awarded the diploma of the college:—

B. H. Bakewell, S. G. Baldwin, V. M. Crosse, J. C. C. Dawson, F. L. Firkin, J. W. Hannay, J. C. Harvey, H. S. Lanceley, G. S. Lester, H. G. Miller, G. D. N. Milne, H. G. Rees, S. R. Saunders, S. Shrikhande, W. J. Stokes, and M. Thomas.

Royal Faculty of Physicians and Surgeons of Glasgow

At a meeting of the faculty, with Dr. John Henderson in the chair, Dr. Samuel Lazarus was admitted to the fellowship.

Colonial Medical Service

The Secretary of State for the Colonies has appointed Dr. A. G. R. Smart to be his assistant medical adviser.

Dr. Smart was a member of the Malayan Medical Service from 1912 to 1934. From 1935 until recently he held the appointment of senior medical officer at St. Vincent.

Royal Medical Benevolent Fund

The 102nd annual general meeting of the fund will be held at 11, Chandos-street, London, W., on April 5th at 5 P.M., when Sir Thomas Barlow, F.R.S., the president, will be in the chair.

London Jewish Hospital Medical Society

The annual oration of this society will be delivered by Prof. Henry Cohen on Sunday, May 1st, at 7, Sussex-place, London, N.W., at 8.30 P.M. He has chosen as his title "A Century Ago—a Medical Retrospect."

Beit Memorial Fellowships

An election of junior fellows will be held in July, 1938.

The fellowships are of an annual value of £400 or £300, and they are tenable for three years. The trustees will give some preference to candidates proposing to investigate mental diseases.

Further information will be found in our advertisement columns.

Demonstrations of Contraceptive Technique

On Thursday, April 7th, at 2.30 P.M., a practical demonstration of the technique of the use of a variety of contraceptive methods will be given at the clinic by Mrs. Marie Stopes, D.Sc., and Dr. Evelyn Fisher. Medical practitioners and senior students should apply for tickets to the hon. secretary of the Clinic for Constructive Birth Control, 108, Whitfield-street, London, W.1.

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Lt.-Col. L. T. Poole, assistant professor of pathology at the Royal Army Medical College, has been appointed hon. physician to the King in succession to Lt.-Gen. Sir James Hartigan, who has retired.

Pharmaceutical Society of Great Britain

The Privy Council have nominated Sir Walter Langdon-Brown and Prof. W. J. Dilling as members of the council of this society in succession to Sir Humphry Rolleston and Prof. J. A. Gunn who have retired. Sir Malcolm Delevingne will continue as the third member nominated by the Privy Council.

George Henry Lewes Studentship

Applications are invited for this studentship, which is of an annual value of £250.

The student is required to give his whole time to research work, normally in the department of physiology, Cambridge, and application should be sent before June 15th to Prof. E. D. Adrian, F.R.S., at that address.

Further information will be found in our advertisement columns.

International Guild of Hospital Librarians

The second conference of the guild will be held in Berne from June 7th to 10th, and optional excursions to the Bernese Oberland and Lucerne have been arranged for June 11th and 12th. The speakers will include Mrs. M. E. Roberts, Mrs. Beddington, Mrs. Raymond, Dr. Georges Duhamel, Prof. Walter Gut, and Dr. Wyrsch. Further information may be had from the secretary of the guild, 48, Queen's-gardens, London, W.2.

Royal Society of Medicine

The society's house and library will be closed from April 15th to 18th, both days inclusive.

Medical Sickness, Annuity and Life Assurance Society, Ltd.

At the annual general meeting of this society held in London on Tuesday last, Dr. F. C. Martley, the chairman, said that the year ending last December had as a whole been satisfactory; the total life assurances showed a small increase and the sickness a very small decrease. The result of the bonus declaration came too late to affect the returns, but since January, 1938, there had been a really substantial increase in both life and sickness as compared with the previous year. The society's funds were growing rapidly and stood at over 1½ million pounds; at the present rate of growth they would, if affairs pursued their normal course, be well over the 2 million mark by the next valuation. The directors felt that in these difficult times it was wise to follow a cautious policy.

The two retiring directors, Dr. Martley and Sir William Willcox, were unanimously re-elected. On the proposition of the chairman, it was agreed to recommend the payment of an interim bonus on all with-profit policies for permanent sickness and accident insurance, and life assurances becoming claims during the year ending Dec. 31st, 1938. Votes of thanks were accorded to the staff and to the chairman.

Appointments

CARSE, JOSHUA, M.D. Durh., D.P.M., Medical Superintendent of the West Sussex County Mental Hospital, Chichester.

COOKSON, J. S., M.B. Camb., Assistant Medical Officer for Derbyshire.

CUNNINGHAM, J. K., M.B. N.Z., Junior Resident Assistant Medical Officer at Bretby Hall Orthopædic Hospital, Derby.

DEVILLE, P. M., M.R.C.P. Lond., Hon. Physician to the Hospital for Diseases of the Skin, Blackfriars.

HARRIS, N. G., M.D., M.R.C.P. Lond., D.P.M., Hon. Physician in charge of the Department of Psychological Medicine at the Middlesex Hospital.

JONES, W. W., M.B. Lond., Assistant Tuberculosis Officer for Sheffield.

SWAIN, MARJORIE, M.B. Manch., Resident Medical Officer at the Fulham Maternity Home and Assistant Medical Officer for Maternity and Child Welfare for Fulham.

London County Council.—The following promotions have been made in the council's mental services. A.M.O. = Assistant Medical Officer:—

MACMAHON, J. F., M.D. Dubl., D.P.M., Deputy Medical Superintendent, Leavesden Hospital;

WALK, ALEXANDER, M.D. Lond., D.P.M., First A.M.O., Cane Hill Hospital;

CHILD, J. P., B.M. Oxon., M.R.C.P., D.P.M., Second A.M.O., Banstead Hospital;

SHAW, DAVID, M.D., M.R.C.P. Lond., Second A.M.O., Bexley Hospital;

FIRMIN, DOREEN P., M.B. Camb., M.R.C.P. Lond., D.P.M., Second A.M.O. in the mental services and seconded for duty at the mental observation unit at St. Pancras Institution; and

REES, W. G., B.M. Oxon., M.R.C.P. Lond., D.P.M., Second A.M.O. in the mental services and seconded for duty at the mental observation unit at St. Francis' Hospital.

Certifying Surgeons under the Factory and Workshop Acts: Dr. K. J. M. GRAHAM (Acton and Ealing, Middlesex); Dr. J. E. FORAN (Barking, Essex); Dr. J. R. CALDWELL (Carnforth, Lancaster); Dr. A. WYNROE (Mossley, Lancashire); Dr. J. G. THOMSON (Radstock, Somerset); Dr. I. CAMPBELL (Swinton, York, W.R.); Dr. T. GIBSON (Worthing, Sussex); Dr. H. R. STUBBINS (Ystalyfera, Glamorgan); Dr. F. C. M. MCILWRICK (Callander, Perth); Dr. A. M. WATT (Dunkeld, Perth); Dr. J. O. SCHOFIELD (Morley, York, W.R.); Dr. F. P. MEEHAN (Duns and Chirnside, Berwick).

Vacancies

For further information refer to the advertisement columns

Accrington, Victoria Hosp.—H.S., £175.
Ashton-under-Lyne District Infirmary.—Res. Surg. O., at rate of £200.
Bedford County Hosp.—H.S., at rate of £155.
Belgrave Hosp. for Children, Clapham-road, S.W.—Two H.P.'s and one H.S., each at rate of £100.
Birkenhead Municipal Hosp.—Res. M.O., £300.
Birmingham City Education Committee.—Two Asst. School M.O.'s, each £500.
Birmingham Royal Cripples Hosp.—Res. H.S., at rate of £200.
Birmingham United Hosp.—Psychologist for Nerve Hospital, £500.
Birmingham and Midland Eye Hosp.—H.S., at rate of £130.
Brighton Education Committee.—Asst. School M.O., &c., £500.
Bristol Eye Hosp.—Jun. H.S., at rate of £100.
Bristol University.—Sen. Clin. Pathologist, £700–£800.
British Postgraduate Medical School, Ducane-road, W.—First Asst. in Dept. of Obstet. and Gyn., £250–£500.
Cambridge, Dept. of Physiology.—George Henry Lewis Studentship, £250.
Capetown City.—Tuberculosis Officer, £800.
Central London Throat, Nose, and Ear Hosp., Gray's Inn-road, W.C.—Assts. in Out-patient Dept.
Central Middlesex County Hosp., Willesden, N.W.—Jun. Res. Asst. M.O., at rate of £250.
Chelmsford County Council.—Temp. Tuberculosis Officer, £15 per week.
Chester, Barrowmore Tuberculosis Sanatorium and Settlement, Great Barrow.—Jun. Asst. M.O., at rate of £200.
Chester Royal Infirmary.—H.S., £150.
Colchester, Essex County Hosp.—H.P., £150.
Coventry and Warwickshire Hosp.—Cas. O., H.P., two H.S.'s, and H.S. to Ophth. Dept., each at rate of £150.
Derbyshire Royal Infirmary.—H.P., £150.
Dorchester, Dorset County Hosp.—H.S., at rate of £150.
Dudley, Guest Hosp.—H.S., £100–£130.
Guildford, Royal Surrey County Hosp.—Res. Surg. O., £250. Also H.S., at rate of £150.
Harefield, County Sanatorium.—Visiting Anæsthetist, 3 guineas per session.
Herefordshire General Hosp.—H.S. to Special Depts., £100.
Holland (Lincs) County Council.—Asst. M.O.H., £600.
Hosp. for Consumption and Diseases of the Chest, Brompton, S.W.—Res. Surg. O., at rate of £150. Also Asst. Res. M.O. and three H.P.'s, at rate of £150 and £50 respectively.
Ipswich, East Suffolk and Ipswich Hosp.—Cas. O., £144.
Italian Hosp., Queen-square, W.C.—Hon. Ear, Nose, and Throat Surgeon.
Kent County.—Asst. Tuberculosis Officer, £600.
Leicester, County Sanatorium and Isolation Hosp., Markfield.—Jun. Res. M.O., at rate of £300.
Leicester, Isolation Hosp. and Sanatorium.—Deputy Med. Supt., £400.
Liverpool City.—Jun. Asst. Bacteriologist, £400.
Llanelly Borough.—Asst. M.O.H. and School M.O., £500.
London County Council.—Asst. M.O.'s (Grades I and II), £350 and £250 respectively. Also Part-time Cons. Pædiatrist, £125.
London Homœopathic Hosp., Great Ormond-street, W.C.—Two Hon. Clin. Assts. for Manipulative Surgery.
London Jewish Hosp., Stepney Green, E.—Ear, Nose, and Throat Registrar, 20 guineas.
London Skin Hosp., Fitzroy-square, W.—Hon. Physician.
Maidstone, West Kent General Hosp.—H.S., £175.
Manchester, Crumpsall Hosp.—Res. Asst. M.O., at rate of £200.
Manchester Hosp. for Consumption, &c.—Asst. M.O. for Crossley Sanatorium, £200.
Manchester Royal Eye Hosp.—Out-patient M.O., £200. Also H.S., £120.
Manchester Royal Infirmary and University.—Dickinson Scholarships, £300 and £75.
Metropolitan Hosp., Kingsland-road, E.—Sen. and Jun. H.P.'s and H.S.'s, each at rate of £100.
Mount Vernon Hosp., Northwood.—H.S., at rate of £150.
National Hosp. for Diseases of the Heart, Westmoreland-street, W.—Res. M.O., at rate of £150.
Northampton County Mental Hosp.—Deputy Med. Supt., £600.
Norwich City.—Asst. M.O.H., &c., £600.

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Nottingham City.—Asst. M.O. for Maternity and Child Welfare, £500.
Plymouth City Isolation Hosp.—Asst. Res. M.O., £300.
Pontefract General Infirmary.—Sen. Res. M.O., at rate of £175.
Portsmouth Education Committee.—Asst. M.O.H. and Asst. School M.O., £500.
Preston and County of Lancaster Royal Infirmary.—H.S. to Eye, Ear, Nose, and Throat Wards and Clinics, at rate of £150.
Reading, Royal Berkshire Hosp.—H.S., H.P., and H.S. to Special Depts., each at rate of £150.
Richmond Royal Hosp., Surrey.—Jun. H.S., £100.
Rochester, St. Bartholomew's Hosp.—H.P., at rate of £150.
Royal Cancer Hosp., Fulham-road, S.W.—Second Asst. Pathologist, £300.
Royal Chest Hosp., City-road, E.C.—Res. M.O., at rate of £150.
Royal College of Surgeons of England.—Professors and Lecturers.
Royal London Ophthalmic Hosp., City-road, E.C.—Out-patient Officer, £100.
Royal Naval Medical Service.—Medical Officers.
Royal Northern Hosp., Holloway, N.—H.P., at rate of £70.
Royal Waterloo Hosp. for Children and Women, Waterloo-road, S.E.—Res. Cas. and Orth. H.S., at rate of £150. Also H.P., at rate of £100.
St. John Clinic and Institute of Physical Medicine, Ranelagh-road, S.W.—Hon. Clin. Asst. in Orthopædic Dept.
St. Mary's Hosp. for Women and Children, Plaistow, E.—Res. Surg. O. and Res. H.P., at rate of £155 and £150 respectively.
St. Paul's Hosp. for Urological and Skin Diseases, Endell-street, W.C.—H.S., at rate of £100.
Samaritan Free Hosp. for Women, Marylebone-road, N.W.—H.S., at rate of £100.
Sheffield, Jessop Hosp. for Women.—Res. M.O., at rate of £150.
Sheffield Royal Infirmary.—H.S. to Ear, Nose, and Throat Dept., at rate of £80.
Staffordshire General Infirmary.—H.P. and H.S., at rate of £150 and £175 respectively.
Stirling District Mental Hosp., Larbert.—Jun. Asst. M.O., £300.
Stoke-on-Trent, Burslem, Haywood, and Tunstall War Memorial Hosp.—Res. H.S., at rate of £175.
Stoke-on-Trent, North Staffordshire Royal Infirmary.—Res. Anæsthetist, £150.
Sudan Medical Service.—Vacancy, £E.720.
Swansea General and Eye Hosp.—H.P., at rate of £150.
Torquay Borough.—Deputy M.O.H. and Asst. School M.O., £600.
University College Hosp. Medical School.—Belt Memorial Scholarships for Medical Research, £400.
University of London.—Chair of Anatomy, at London Hosp. Med. College, £1000.
Walsall General Hosp.—Asst. Hon. Surgeon to Ear, Nose, and Throat Dept.
West London Hosp., Hammersmith, W.—Additional Hon. Reg. to Throat, Nose, and Ear Dept.
Winchester, Royal Hampshire County Hosp.—Two H.S.'s, each at rate of £100.

The Chief Inspector of Factories announces a vacancy for a Certifying Factory Surgeon at Bethesda (Carnarvon).

Medical Diary

April 4th to April 9th

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
TUESDAY.
Orthopædics. 8.30 P.M., Dr. H. J. A. Colvin and Mr. H. J. Seddon: The Treatment of Tuberculosis of the Hip and Spine in Adults. Mr. A. Brownlee will also speak.
WEDNESDAY.
History of Medicine. 5 P.M., Sir Robert Armstrong-Jones: Faith Healing. Dr. B. N. C. Roy and Dr. R. O. Moon will also speak.
Surgery. 8.30 P.M., pathological meeting; specimens will be shown.
FRIDAY.
Clinical. 5.30 P.M. (Cases at 4.30 P.M.) Dr. Joseph Geoghegan: (1) Gouty Tophi and Spondylitis. Mr. Duncan Fitzwilliams: (2) Rhinophyma. Dr. F. Parkes Weber: (3) Osteitis Deformans (Paget) with Pre-tibial Calcified Nodules. (4) Another Member of an Acholuric (Spherocytic) Family described in 1910. Mr. A. Simpson-Smith: (5) Multiple Cysts of Kidney Simulating Mesenteric Cysts. Dr. Philip Ellman: (6) Endocrinal Obesity (Hypothyroidism) with Œdema of the Legs, Osteo-arthritis, and Hypertension. Dr. J. H. G. Mason (for Dr. Thomas Hunt): (7) Muscular Dystrophy with Obesity and Genital Dystrophy (? Fröhlich's Syndrome).
Radiology. 8.30 P.M., Dr. R. S. Paterson, Dr. Struthers Fulton, and Dr. R. H. Sankey: The Planning and Organisation of a Radiological Department in a General Hospital.

HARVEIAN SOCIETY OF LONDON.
FRIDAY.—8.30 P.M. (26, Portland-place, W.), clinical meeting.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.
FRIDAY.—7.45 P.M. (De Vere Hotel, Kensington), Dr. J. F. Halls Dally, Dr. W. S. C. Copeman, and Dr. C. B. Dyson: Recent Advances in Rheumatism.

WEST KENT MEDICO-CHIRURGICAL SOCIETY.
FRIDAY.—8.45 P.M. (Miller General Hospital, Greenwich, S.E.), Mr. M. P. Reddington, Mr. J. B. Blaikley, Dr. T. F. Meyrick, and Dr. F. Hudson Evans: That all Confinements are best conducted in a Midwifery Institution.

MEDICAL SOCIETY OF INDIVIDUAL PSYCHOLOGY.
THURSDAY.—8.30 P.M. (11, Chandos-street, W.), Mr. Aleck Bourne: The Psychological Conditions Underlying Gynæcological Symptoms.

BRITISH INSTITUTE OF RADIOLOGY, 32, Welbeck-street, W.
THURSDAY.—8 P.M., Mr. R. F. Phillips, M.S., and Mr. G. S. Innes: Physical Measurements in High Voltage X Ray Therapy. Miss J. Honeyburne and Mr. W. V. Mayneord, D.Sc.: Note on Depth Doses from Teleradium Units.
FRIDAY.—11 A.M., medical members will visit the new works of Messrs. Newton and Wright (68, Ballards-lane, N.).
5.30 P.M., case demonstration and discussion.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

UNIVERSITY OF GLASGOW.
TUESDAY.—4.30 P.M. (Tennent Memorial Building, Church-street), Dr. Chesar Michaelson: Squint and Other Defects of Muscle Balance.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Portland-place, W.
WEDNESDAY.—3.30 P.M., Dr. Margaret Salmond: The National Importance of Women's Health.

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane-road, W.
MONDAY.—2.30 P.M., Sir Edmund Spriggs: Diseases of Small and Large Intestine.
WEDNESDAY.—Noon, clinical and pathological conference (medical). 3 P.M., clinical and pathological conference (surgical). 4.30 P.M., Dr. C. H. Andrewes: Recent Work on Viruses.
THURSDAY.—2.15 P.M., Dr. Duncan White: radiological conference. 3.30 P.M., Prof. Fletcher Shaw: Genital Prolapse. 4.30 P.M., Mr. Kenneth Walker: Venereal Diseases.
FRIDAY.—2 P.M., clinical and pathological conference (obstetrics and gynæcology). 2.30 P.M., Mr. Geoffrey Keynes: Diseases of the Breast.
Daily, 10 A.M. to 4 P.M., medical clinics, surgical clinics and operations, obstetrical and gynæcological clinics and operations.

CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C.
MONDAY TO FRIDAY.—4.30 P.M., course in methods of examination and diagnosis.
FRIDAY.—4 P.M., Mr. C. Gill-Carey: The Treatment of Sinusitis.

NATIONAL HOSPITAL FOR DISEASES OF THE HEART, Westmoreland-street, W.
TUESDAY.—5.30 P.M., Dr. B. T. Parsons-Smith: Mitral Disease.

ST. JOHN CLINIC AND INSTITUTE OF PHYSICAL MEDICINE, Ranelagh-road, S.W.
FRIDAY.—4.30 P.M., Mr. G. H. Alabaster (for Mr. V. B. Green-Armytage): Physical Medicine in Pelvic Disorders.

MANCHESTER ROYAL INFIRMARY.
FRIDAY.—4.15 P.M., Dr. E. W. Twining: clinical demonstration.

ANCOATS HOSPITAL, Manchester.
THURSDAY.—4.15 P.M., Dr. Arnold Renshaw: Methods of Dealing with Pathological Specimens.

LEEDS GENERAL INFIRMARY.
TUESDAY.—3.30 P.M., Mr. A. B. Pain: demonstration of orthopædic cases.

Births, Marriages, and Deaths

BIRTHS

ALLAN.—On March 19th, at Southsea, the wife of Dr. W. H. Allan—a son.
GRANT.—On March 27th, at Bentinck-street, W., to Dr. Margaret Grant (*née* Gamble), the wife of A. Stanley Grant, of St. James's-court, Buckingham Gate, S.W.—a son.
LANG.—On March 24th, at Hertford County Hospital, the wife of Dr. Fred Lang, of Hoddesdon—a son.
SOMMERVILLE.—On March 23rd, at East Grinstead, the wife of Dr. A. C. Sommerville, of East Grinstead—a son.
SOUTHERN.—On March 21st, at Broughton-in-Furness, the wife of Dr. W. Graham Southern—a daughter.
THORLEY.—On March 20th, the wife of Dr. A. S. Thorley, of Friern Barnet-road, N.—a daughter.

MARRIAGES

HARVEY—HEYMER.—On March 26th, at Kingston-on-Thames John Cuthbert Harvey, M.B., B.S. Lond., to Evelyn Jessie, only daughter of Mr. Herbert W. Heymer, of Surbiton.

DEATHS

BROWN.—On March 27th, in London, Henry Reynolds Brown, M.D. Edin., J.P., of Maldon, Essex.
CHURCHILL.—On March 24th, at West Malvern (formerly of Chesham), John Foot Churchill, F.R.C.S. Eng., aged 95.
DYSON.—On March 22nd, at Monte Carlo, Colonel Thomas Edward Dyson, M.B. Edin., I.M.S. (retd.), aged 77.
FRANCIS-WILLIAMS.—On March 25th, at Dowlais, Cecil Hughes Francis-Williams, M.R.C.S. Eng.
HENDERSON.—On March 25th, at Tunbridge Wells, Hester Morris Henderson, M.B. Edin., eldest daughter of the late William Henderson, of Liverpool.
HOSKYN.—On March 28th, at Exminster, Surgeon Rear-Admiral Donald T. Hoskyn, R.N., of Ashbrittle, Somerset.
SLEMAN.—On March 26th, at Norwood, S.E., Colonel Richard Reginald Sleman, M.D. Durh., L.S.A., Col. R.A.M.C., (T.A.).

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

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NOTES, COMMENTS, AND ABSTRACTS

PREVENTIVE POSSIBILITIES OF GENERAL PRACTICE*

BY HARRY ROBERTS, L.M.S.S.A.

THIS is not an informative lecture, but an introduction to a course of informative lectures, and my only claim to be heard by you lies in the fact that I have been engaged in active general practice for over forty years and consequently have had an unusual opportunity of observing the changes in the relations between the doctor and the patient, and between the doctor and the State in the last three or four decades.

When I started in practice, specialism, on its present-day scale, was unknown. There were, of course, men who specialised in surgery, and others in ophthalmology; a few men had a reputation of knowing a lot about skin troubles, and a few others about disorders of the throat and ear. You could almost count the professed gynæcologists on the fingers of your hand. The G.P. covered nearly all the ground, and, for ninety-nine people out of a hundred, provided all the medical and surgical treatment they received between birth and death. In the then state of knowledge, I doubt if the public lost much by this arrangement.

In my first practice near Lands End the nearest hospital and the nearest specialist worth talking about were in Plymouth, over sixty miles away, and there were no ambulances of any kind. I was often confronted with the dilemma of tackling a fairly major operation that I had never performed before, or leaving my patient to certain death. Sometimes I was lucky, sometimes not so lucky. Removing a tumour with the patient lying on the ground outside a gipsy tent, and throwing the swabs into a camp fire, has elements of excitement of its own. The amputation of a breast in a cottage bedroom is not quite the same thing as giving a note of recommendation to the nearest hospital.

PRACTICE

The point I want to make is, that the general practitioner of those days had no easy way of escaping his responsibilities; he had to be a first-rate practical doctor. He killed a lot of people, but he saved more from avoidable death. His success depended on two things—his personal capacity for inspiring confidence in his judgment, and the results of the treatment he prescribed.

All doctors realise nowadays that in every illness and in every cure there is a big psychic or emotional element. Nobody who has been in practice half as long as I have could doubt it. "Blarney, you mean," says the supercilious, super-scientific unsuccessful. Not at all. Mere blarney cuts very little ice. I agree that a certain measure of tactful reticence on occasion helps to maintain confidence, and that not every patient or every patient's friend provides suitable soil on which the whole truth can usefully be broadcast. My experience has been that it nearly always pays to tell a patient, or at any rate his responsible relatives and friends, as much of the truth as you confidently know yourself. I reckon it one of the biggest compliments that can be paid me when I hear that a patient has said of me: "Oh, he's all right. He tells you straight," and I feel similarly flattered when I hear that a patient has said to a neighbour: "Oh, I don't take no notice of him; he's just like one of ourselves." And this brings me to what seems to me a fundamental mistake in conventional medical procedure.

MYSTERY-MEN

Right through the ages we have posed as mystery-men—as possessed of a lot of knowledge which laymen could not begin to understand. In the Dark Ages that went down very well, but since 1918 it won't do at all. I believe in nearly every case the most honest and, from a self-preservative point of view, the wisest course is to put all our cards on the table; pretend to no knowledge we do not possess; explain to people, in language to which they are accustomed, as much of the truth as they can grasp; point out to them the difficulties and the limitations of medical art; and expound to them what we are trying to do and how we are trying to do it. It is no longer necessary for us, from any point of view, to pretend that we are medical know-alls. The majority of people are well aware that there are no such creatures. Five years ago Sir Kaye Le Fleming said:—

"Preventive medicine cannot develop as it should without the coöperation of the public. Good health should be the right of every citizen, and the doctor's responsibility is not discharged by treatment alone. The patient has a right to know why he is ill, as well as the steps he must take to get well. Not until he insists on this point as a matter of course will preventive medicine come into its own."

Not all doctors who are well furnished with technique and the kind of knowledge expressed in medical text-books and investigated by medical examiners are equally successful in practice. And I am not thinking only of numbers of patients or size of professional income but of success in curing sick people and of helping healthy people to keep well. Many of us when we leave our medical school are far too apt to look upon diseases as so many demoniac entities which we are peculiarly equipped to exercise, but we soon find in practice that we are confronted not so much by diseases as by men, women, and children who are ill.

When I started doctoring I had a lot of pre-graduate interests highly relevant to the work of a general practitioner. From my schoolboy days I was interested in the people with whom I came into contact in the country village where I lived; in their different ways of looking at things and in their different problems. I knew what their suppers were like, and how crippled their parents often were, and the sort of amenities they enjoyed—and didn't. A little later I was attracted by the philosophic and economic discussions that were being conducted in the reviews and on the platforms of lecture-halls. I found these interests of the greatest help in medical practice; and to them, quite as much as to the small amount of specialist knowledge which I possess, I attribute such success as I have had in my medical career.

General practice to-day is a very different thing from when I started out forty years ago, and a very different thing from what we may call general practice twenty years hence. To-day we are at the parting of the ways; and I think that only exceptional individuals can make of general practice during the

* Inaugural address (abridged) of the Post-graduate Course in Preventive Treatment, delivered in B.M.A. House on March 30th.

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intermediate period a dignified, interesting, and socially valuable career. Yet, as Lord Horder pointed out a couple of months ago :—

"The family doctor is capable of being the most valuable member that society possesses. Without the mediation of the doctor, how are the common people to link up with the health services? The question is whether the doctor has the courage and independence to adapt himself to the world that he lives in, rather than to the world in which his father or his grandfather lived."

A CHANGING PUBLIC

We all know that at the moment a large section of the public, especially the intelligent public, does not think much of the general practitioner.

No informed, unbiased doctor in this country can doubt that we ourselves are responsible for no small part of our fall in popular esteem. I am no sentimental believer in the sanctity of the old-fashioned family doctor. I believe that the average general practitioner of to-day compares well with him in technical knowledge, social conscience, and general decency. But a great change, and in my opinion a very desirable change, has taken place in the popular mind. Look at the books of which the Penguin and Pelican series are able to sell fifty to a hundred thousand copies apiece—books by Freud, Laski, Leonard Woolf, Clive Bell, and the rest. Thirty years ago there would have been a difficulty in selling a couple of thousand of any one of these books. We are no longer dealing with the same public, or with a public possessed of the same standards. The new public demands more, deserves more, needs more. I can't help wondering, doubtfully, if we have kept pace.

FUNCTION OF THE PRACTITIONER

The basic importance of the general practitioner, the family doctor, in any national system of health services should be as obvious to everyone in Whitehall, and to every intelligent member of the public, as it is to the leaders of our own profession. No matter how specialism and hospital and clinic systems may develop, it is clear that there must be some preliminary selection of cases. It would be foolish for everyone with a headache or digestive upset to rush off to a hospital, diverting energy and time from the therapeutic and special work which should be its main concern. As one result of his education, the average doctor in this country, whatever his faults and limitations, is an excellent diagnostician—that is to say he can nearly always recognise the physical diseases to which names have been given—and this is a very valuable thing, which such post-graduate courses as the present will do much to foster. I believe that mastery of the art of diagnosis is the biggest contribution which the general practitioner can make to social well-being. Indignation has been expressed at this conception of the private doctor's most important function. It has been suggested that it reduces him to the position of a shop-walker who merely directs customers to the appropriate department, but a truer parallel is furnished by the police-court magistrate, whose work is not generally regarded as petty or contemptible. But diagnosis, even for the general practitioner, is not enough. He is, or should be, competent to apply all relevant existing knowledge to the treatment of 99 per cent. of the patients who consult him. In dealing with this majority he is as competent and as potent as the most be-baroneted royal physician or surgeon.

PREVENTION

In addition to these two functions, there is one other (possibly the most important of all) which, although it would seem to be within his obvious province, the general practitioner has fulfilled but indifferently—the prevention of disease. Preventive medicine is verbally all the rage. Great surgeons and great journalists join humble practitioners in paying homage to the ideal of prevention; and though their exhortations are not always convincing, the general sentiment which is used to justify them is sound, and is shared by an increasing number of people. Yet, in the whole course of medical training, the principles of healthy living are hardly referred to. If the general practitioner of to-day has any knowledge of personal hygiene, or of the personal care of health, it is safe to say that he did not acquire it within the walls of his medical school.

Samuel Butler has remarked: "A physician's physiology has much the same relation to his power of healing as a cleric's divinity has to his power of influencing conduct." The additions to our physiological knowledge in the last half-century have been enormous, and have radically altered the potentialities of the medical art. All sorts of hygienic rules which had none but empiric basis, and were therefore open to sceptical criticism, are now known to have chemical and physiological validity. The outstanding medical victories of the past hundred years or so are in the realm of preventive medicine. Sanitary reforms can claim most of the praise for the great fall in the national death-rate, and especially for the disappearance or diminution of the great epidemic scourges, such as plague, typhus, infantile gastro-enteritis, and typhoid. The improvement in the standard of living of the poor, and the wider availability of good and suitable food has done more to lower the incidence and the fatality of tuberculosis than has any specific medical treatment. We general practitioners had no particular share in these successes; sometimes, indeed, we played the part of conscientious objectors.

A little while ago the possibilities of preventive medicine seemed to be nearing their limits. Further knowledge and experience have shown that this is far from the case, even in the realm of collective hygiene. So long as there is a wide disparity as at present between the death-rates of the poor and the rich, and of the industrial towns and the agricultural districts, there is obviously plenty of scope for our social and economic reformers; and it is up to us general practitioners, who alone have the right of entering the homes of the people on confidential, friendly terms, constantly to force the facts on the public attention. It is not irrelevant, and, in a cynical way, not unamusing, to quote the words of Mr. Lloyd George in 1911, when he was telling the public about the glorious results that would follow the passing of the National Insurance Act.

"The insurance committees," he said, "will have to make reports to the municipalities and the Government on the health of their districts as it affects the administration of the Act. These reports will be most valuable. For the first time you will have reports on the health of 15 millions of working-class households in this country. Think of what that means! There is no end to what you may be able to do in the way of social reform upon these searching, penetrating and all-pervading reports on the causes of disease in the homes of the people. I am not for a moment minimizing the admirable work that is done by the medical officers of health. But a medical officer of health cannot visit every house in his district.

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Here, on the other hand, you will have tens of thousands of medical men who will be serving those local health committees, visiting in the course of the year almost every home, and sending faithful reports to the health committee, upon which the majority will be representatives of the working-classes. Therefore, the doctors will not have to consider in their reports the feelings and idiosyncrasies of men on the committee who possess local interests. They will be reporting to men whose main interest is the good health of their own families. For the first time in the history of this country you have got that portentous fact to reckon with in social reform."

It is not to our credit as panel doctors that we have let this promise slide so easily into oblivion.

But another fact has emerged. Preventive medicine, we now see, is of individual no less than of collective application. The value of our new scientific knowledge is more than half wasted if the public cannot understand it. Moreover, even for its effective social application, the collaboration of the individual is found to be necessary; and this collaboration can be secured only if informed persons in direct contact with ordinary men and women—persons in whom those individuals have confidence as friends and advisers—act as missioners of health. I believe that it is as a hygienic missionary, a medical officer of health to the individual, that the ordinary practising doctor of the present, and even more of the future, can render the greatest service to the community. There is no one else in so favourable a position for doing this work.

There is a popular idea that between treatment and prevention there is a fundamental distinction. This is but a half-truth. Every time we successfully treat a wound of the hand we prevent the serious consequences that might follow. Every time we deal successfully with infections of the tonsils or of the nasal sinuses we prevent the graver consequences of which these are often the forerunners. All medicine is, in a sense, preventive in aim—it endeavours to prevent the bad coming to the worse. None of us can complacently boast that his mental and bodily structure will never call for conscious attention. The nearest approach to practical wisdom in this matter is embodied in the maxim: "A stitch in time saves nine." We inject antidiphtheritic serum, or send a "delicate" child away into the country, or walk briskly five miles before breakfast, or have our drains attended to, or include iodine, thyroid, or even digitalis in our daily dietary, as differing pathological tendencies indicate. And in all these measures, the curative and the preventive are closely interblended.

A FINAL WORD

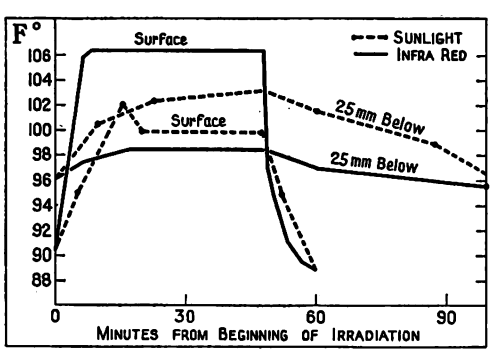
There are two things I would like to say in conclusion. Largely as a result of our own policy and public expressions we have, especially since the passing of the Insurance Act, been suspected by the public of caring only for the money we can get for our services. There is no occasion for cant about this. Ninety-nine people out of every hundred want all the money they can get. But it is unfortunate that the impression has got about that we do not much care about anything else. In the long run, the best way to get more money is to prove that we're worth more money. There are three codes of conduct in this matter. There is what I call the Cad's code, "Get the most you can and give the least you can"; the Gentleman's code, "Give the most you can and take only what you need"; and what may be called the Quaker's code, "Get the most you can, give the best you can." This last is a good enough working code for most of us.

And the other point. It is not easy for a practising physician or surgeon, inevitably preoccupied with symptoms and urgent consequences, habitually to take that wide view of phenomenal sequence and interrelation which is necessary if light is to be thrown on the great problems of prevention. There is a well-known Hippocratic saying that "to know the nature of man, one must know the nature of all things"; to which may be appended the maxim of an old Spanish physician: "If you only know medicine, you don't know that."

THE MODERN GAS FIRE

RESEARCH has made many changes in the gas fire in the last thirty years. Modern burners are silent and their more efficient combustion makes for economy. Vertical radiants have replaced the lumps of fire-clay held in place by a grid, and they now fill the entire fire opening. More subtle changes in the design and composition of the radiants have ensured that they now glow with a yellow-red instead of a dull red heat, and it is largely to this that the modern fire owes its more pleasant warmth.

The pleasantness of a source of radiant heat depends upon the wave-length of the rays it gives off. Long infra-red rays—those farthest removed from the visible spectrum—do not penetrate the epidermis; they heat the surface but have little effect upon the deeper tissues. This has been shown by Loewy and Dorno, who found that by irradiation with long infra-red rays the temperature of the surface of the skin could be raised to over 106° F., while at a depth of 25 mm. it remained at body temperature. Irradiation with the short and visible rays of sunlight, however, produced the reverse effect, the temperature at the surface being 100° F. when at a depth of 25 mm. it had risen to 103° F. (see Figure).



Temperature at the surface and at a depth of 25 mm. during irradiation with sunlight and with infra-red rays. (After Loewy and Dorno (1925) *Strahlentherapie*, 20, 430.)

As a result the heat of the longer rays is concentrated at the level of the free nerve-endings in the skin and these convey to the mind a sensation of dryness and constriction which is definitely unpleasant. Short rays, on the other hand, exert their maximum effect at a level where their heat can be carried away by the circulating blood and produce a more comfortable sensation by exciting flushing and transudation.

The freshness of a room depends upon the amount of air movement and upon the proportion of long waves which reach the skin of the observer. At ordinary room temperatures the humidity is unimportant; it is only in a really hot atmosphere that greater humidity causes discomfort by impeding evaporation from the skin. Thus in a stuffy railway carriage or a heated glass-house the stuffiness is

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due to the long rays given off inside, and days are felt to be close when there is little breeze and the sun-heated ground is giving off long rays which are trapped by the haze. To make a source of heat more comfortable its proportion of short infra-red rays must be raised as far as possible, and this is what has been done with the newer gas radiants. The proportion of rays less than 2 μ in wave-length—i.e., those with appreciable penetration—is now 8·7 per cent., which compares favourably with the proportion of the older fires. The increase in penetration is considerable. Measured through a clarified ox-horn screen $\frac{3}{8}$ mm. thick, an old fire showed a penetrancy of 8·2 per cent., while with a new type as much as 12·3 per cent. penetrated. Finally, Sir Leonard Hill has found that the airways of the nose and lungs are reflexly narrowed by the longer rays, and this may be a further explanation of the increased comfort of shorter wave-length radiation.

CHILDREN'S MINIMUM COUNCIL

AT a luncheon held by this council on Wednesday last at the London School of Economics the menu was based on recipes from the British Medical Association's cookery book, and the cost per head at bulk prices was estimated at 5*d*. Lord Horder, who presided, said he was not enamoured of minimums; it seemed to him a grim joke for medical men to be trying to find how little would suffice to keep a child whole; and though the council of course aimed at security for the minimum he would rather concentrate on making better use of the food that was wasted—the millions of herrings thrown back into the sea, and the milk sold cheap to manufacturers. Mrs. Yates, wife of an unemployed man, pointed out that 5*d*. a head was an impossible sum to spend on dinner; her special Sunday dinner for herself, her husband, and her little boy cost only 7*d*. Miss Eleanor Rathbone, M.P., chairman of the council, said that for families with five children the gap between physical needs and unemployment allowances amounted to 15*s*.–16*s*. a week (see *Lancet*, Feb. 5th, p. 356), and many wage-earners were no better off. For each child 3*s*. was now allowed, and if a pint of milk was taken daily, as recommended by the B.M.A. nutrition committee, this left 8*d*. a week for the rest of the child's food, its clothes, and all other expenses. The Children's Minimum Council, Miss Rathbone said, had been partly responsible for the introduction of the school-milk scheme, had helped to get the allowance for children raised to 3*s*., and had popularised rent rebates by local authorities. Its expenditure was only £600 a year, and she asked for help in response to this first public appeal. Mr. Harold Nicholson, M.P., said that besides "starvation in the midst of plenty" there was "ignorance in the midst of knowledge." Education and the upbringing of the young depended on their having enough of the right food, and now that knowledge existed we must cease to be so lazily optimistic about the inside of the people round us. Sir Kaye Le Fleming announced that the B.M.A. book, of which 130,000 copies were sold before it was advertised, is to be reissued in revised and more convenient form.

AN ALIBI

IT is a well-known fact that in the high temperature carbonisation of coal as used in the manufacture of gas carcinogenic hydrocarbons are formed. In fact the experimental study of carcinogenesis as practised during the last 20 years is based on experiments in which coal tar obtained from gas works was applied to the skin of mice and was found to produce cancer of the skin. Mr. Brownlie's theory [1] is that these carcinogenic hydrocarbons, which are solid substances at ordinary temperature and have a high boiling point, pass into the coal gas after the latter has been purified "forming one of the chief constituents of average manufactured towns gas supply." No evidence is adduced in support of this statement and on inquiry we are informed that there is no reason to suppose that coal gas as manufactured at present and supplied to the consumer contains any carcinogenic hydrocarbons. There is thus no prima-facie case for the author's thesis that "a large proportion of cancer cases are due to eating contaminated food resulting from the widespread use of manufactured towns gas for cooking. . . ." The alibi is sufficient.

[1] The Cause of Cancer. By David Brownlie, B.Sc. (London). London: Chapman and Hall. 1938. Pp. 208. 7*s*. 6*d*.

COUPONS FOR A MEDICAL CHARITY

Dr. HENRY ROBINSON writes from 49, Bedford-square, London, W.C.1: "Four months ago you kindly allowed me to appeal to the profession for help in collecting coupons from the *Daily Mirror* and *Daily Sketch* on behalf of the Sherman Bigg Fund, administered by the Royal Medical Foundation of Epsom College. As this scheme ends on March 31st, you may be willing to allow me to report the results. First, may I give you a brief résumé of the work of the Sherman Bigg Fund for 1937? The income from Mr. Bigg's bequest was £155; and special donations to augment it raised the total to £774, which, for the third year's working of the fund, may be regarded as reasonably satisfactory. From this, 32 educational grants were made for girls and boys, and 8 maintenance grants for widows or orphans. Next, as to the coupon collection. From various friends whose help had been enlisted before I wrote to you, some 20,000 coupons have been received, value about £10. The great bulk of these have come from the medical superintendents of several London county hospitals, whose kindness I desire to acknowledge most thankfully. Anonymous correspondents have sent in about 1300 coupons; 1000 of these in one envelope may have come from one of the hospitals aforesaid; and if that is so, the total response of the medical profession to my letter has been of the value of not quite three shillings. Any comment of mine upon this fact would be expressed in language which you, Sir, would probably not care to print. I am, however, still hoping for collections to reach me after the end of the month."

NEW PREPARATIONS

NEO-FEMERGIN.—Ergotamine tartrate has been used in gynæcology and obstetrics since 1920, and is issued by Sandoz Products of Basle under the name of Femergin. In 1935 workers in England, Switzerland, and the United States almost simultaneously discovered the new alkaloid known in this country as ergometrine (Dudley and Moir). A combination of ergotamine tartrate (2 parts) and ergometrine tartrate (1 part) is now offered under the name of Neo-Femergin by J. Flint, Sandoz Products, 134, Wigmore-street, London, W.1. The ergometrine, it is stated, induces rapid but comparatively transient, uterine contractions, while the action of the ergotamine is slower but more prolonged. Injection of Neo-Femergin is considered "the treatment *par excellence* for postpartum atony and hæmorrhage," and the preparation is sold in ampoules as well as in solution and tablets for oral administration. The particular indications for ergotamine (Femergin), ergometrine (Basergin), and the new product are discussed in a booklet on the Alkaloids of Ergot of Rye published by the manufacturers.

A medical price list and compendium for 1938 reaches us from GEDEON RICHTER (GREAT BRITAIN), LTD., 14, Weedington-road, N.W.5. Besides brief accounts of many hormone preparations it contains a list of drugs, pills, tablets, and concentrated mixtures.

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ADDRESSES AND ORIGINAL ARTICLES

THE FUNCTION OF THE BRONCHIAL TUBES *

BY MAXWELL ELLIS, M.D., M.S. Lond., F.R.C.S. Eng.†

ASSISTANT SURGEON TO THE GOLDEN SQUARE THROAT HOSPITAL, AND AURAL SURGEON TO THE PRINCESS BEATRICE HOSPITAL, LONDON

WHILE an assistant in the Chevalier Jackson Bronchoscopic Clinic some years ago I became interested in the movements of the bronchial tubes, especially in cases of asthma where the phenomenon is particularly vivid. There is no concise and well-documented account of the function of these tubes—even the structure has not been fully elucidated—the difficulty being that research workers were unable to record the movements directly. The bronchoscope removed this objection, at least for the larger bronchi, and I was able to devise a method of recording the changes in calibre and length. It is with the former change that this lecture will be chiefly concerned.

ANATOMY

The trachea divides into two main bronchi which in turn branch into smaller tubes. The smallest tube in this conducting portion of the bronchial tree is the terminal bronchiole. From this arise respiratory bronchioles, in the walls of which there are the alveoli. The respiratory bronchioles lead to alveolar ducts which branch into other alveolar ducts. Their walls bear alveoli and bulbous enlargements, the alveolar sacs, in which the ducts also terminate. The walls of these sacs are formed by alveoli, the portion of lung tissue where the gaseous exchange with the blood occurs. I may say here that some histologists give a slightly different account of the respiratory unit, but that briefly described above and illustrated (Fig. 1) is most commonly accepted—e.g., Miller (1921), except for his postulate of "atria" intervening between the alveolar ducts and alveolar sacs.

The structure of these tubes was first accurately described by Reisseisen (1822) who painstakingly dissected with hand lens, scalpel and forceps. The bronchial muscle is named after him, and he traced it nearly to the terminal bronchioles. Since then, Miller has contributed much valuable information in a series of papers spread over nearly forty years, especially concentrating on the muscle-fibre distribution in the respiratory bronchiole and its offshoots. Many others have worked successfully in this field and a full bibliography will be found in Macklin's review of the subject (1929).

Essentially, the tubes consist of a myo-elastic network with the larger branches stiffened by fibro-cartilage. In the trachea, this latter structure is in the form of incomplete hoops, open posteriorly where smooth-muscle fasciculi bridge across the gaps, being attached to the edges of the hoops on the inner surfaces. These fasciculi branch, connecting several rings at different levels, and, at the bifurcation, these oblique strands come to lie in the long axis of the tubes. In the larger bronchi, this network structure of muscle-fibres loses its attachment to the cartilage, now consisting of irregularly arranged plaques, and becomes a continuous sheet embracing the whole circumference of the tubes internal to the plane of the cartilage. The strands assume a more spiral direction, enclosing lozenge-shaped areas. This arrangement is continued on the same morphological plan into the terminal bronchioles, and, although the actual mass of muscle becomes less, it occupies a higher proportion of the wall of the tubes. In the respiratory bronchioles, the fasciculi are more delicate and enclose the origins of alveolar duct and alveolus out-pouchings, and the same almost sphincteric formation as far as the alveoli are concerned is preserved in the alveolar ducts.

Closely following the arrangement of the muscle-fibres is a network of elastic tissue. In the larger tubes it consists of two distinct portions—one of thin fibres intermixed with the muscle, and the other of stouter fibres on a more internal plane. This

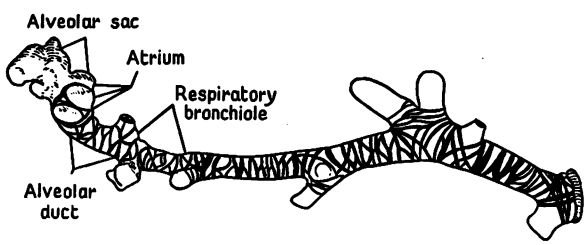

FIG. 1.—Respiratory bronchiole and its subdivisions (after Miller 1921).

segregation is lost in the smaller bronchioles where the two structures coalesce. These two completely separate systems of muscle and elastic tissue can throughout be regarded as a morphological and functional unit, the myo-elastic sheet. Another set of elastic fibres occurs in the adventitia, the connective tissue external tunic of the tubes, and strands pass to it from the myo-elastic layer. The adventitial coat eventually forms the stroma of the alveoli. Both these layers contain many blood-vessels and nerves. The vessels of the conducting portion of the airway (both in the adventitial and myo-elastic layers) are derived from the bronchial arteries and, in the respiratory portion, from the pulmonary arteries. They are united by a capillary anastomosis. The mucous membrane rests on a loose, vascular tunica propria (containing the internal elastic membrane of the larger tubes, described above) which intervenes between it and the myo-elastic tunic. Mucous glands occur between the latter and the cartilaginous coat with ducts piercing the muscle.

THEORIES OF FUNCTION

The striking feature of the physiology of the lungs is motion, and the changes undergone by its various constituents during respiratory movements have always been the subject of speculation and inquiry. From the structure that he had uncovered Reisseisen deduced that the bronchial tubes elongate and widen during inspiratory movements and shorten and contract with expiratory ones. As the chest wall moves outwards and the diaphragm downwards in inspiration, the lung following, the bronchi of the middle and lower lobes must necessarily lengthen. Keith (1909) described a direct connexion between the crura of the diaphragm and the lung roots whereby the latter are dragged downwards during contraction

* A Hunterian lecture delivered at the Royal College of Surgeons on Jan. 28th.

† From the Chevalier Jackson Bronchoscopic Clinic, Philadelphia, and the Medical Unit, University College Hospital, London. For three of the four years over which the work in this paper was spread the author held the Geoffrey E. Duveen studentship in oto-rhino-laryngology of the University of London, and it was completed during the tenure of the Percival Alleyn scholarship for surgical research at University College Hospital.

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of the former, producing elongation of the upper lobe bronchi. These respiratory length changes were portrayed by Bullowa and Gottlieb (1920) using radio-opaque oils in the bronchi and X rays, and their existence has many times since been confirmed by other workers. Ingals (1905) and Jackson (1917) actually saw these movements through the bronchoscope, and Weingaertner (1920) measured in man the vertical displacement of the carina by introducing endoscopically an aluminium pointer straddling the bifurcation. I was able at various points in the larger bronchi of dogs to fix a hook carrying a thread which passed through the bronchoscope and was attached to a writing-lever recording on a kymograph. The actual longitudinal distance traversed by the particular point in the tubes was thus measured.

If the tubes were composed of some elastic material, elongation would be accompanied by constriction. Reisseisen decided, however, that thoracic expansion must result in widening as well as lengthening of the bronchi. From the network arrangement of the muscle he deduced that its contraction should result in shortening and narrowing, and that its relaxation can permit of the opposite changes. The other constituents of the bronchial wall would readily allow of these movements. Experimental investigation of calibre changes was slow to follow the theoretical deductions of the anatomist. Indeed, practical inquiry into the function of the bronchial muscle and tubes has been so difficult of achievement that detailed knowledge is still lacking.

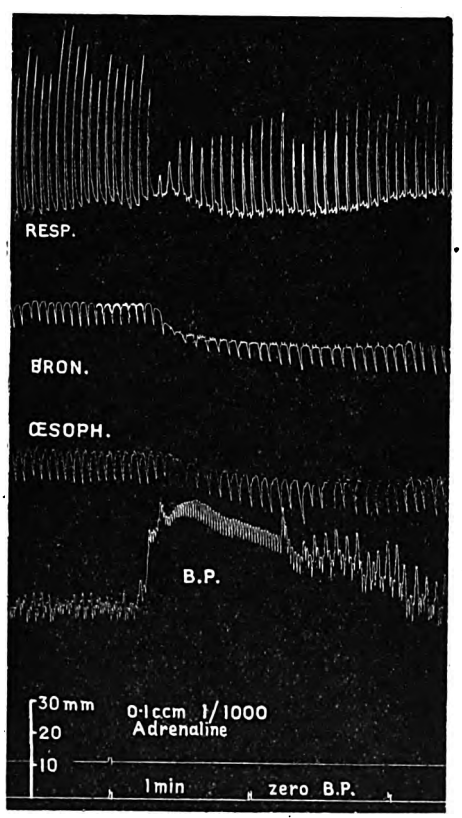

FIG. 3.—Adrenaline effect on bronchus.

The invention of the bronchoscope led to the observations of Ingals and Jackson noted above on changes in length. They described, in addition, expansile and contractile movements synchronous with respiratory movements and occurring respectively in the inspiratory and expiratory phases.

Previously, Dixon and Brodie (1903) measured the increase and decrease in volume of a lobe of the lung encased in a plethysmograph. Sandmann (1890) concentrated on the measurement of intratracheal and Jackson (1913) on intrapleural pressures. MacGillavry (1877) passed air through the trachea at a constant rate, allowing it to escape through scarifications of the surface of the lungs, and measured the variations in intratracheal pressure. McDowall and Thornton (1930) adopted the same method but used fluids instead of air. Einthoven (1892) forced air into the lungs and allowed their natural elasticity to expel it, measuring the intratracheal pressures. Trendelenburg (1912) studied the reactions of isolated strips of bronchial muscle of the ox and sheep. Bullowa and Gottlieb (1920) observed fluoroscopically the behaviour of the bronchi outlined with iodised oil.

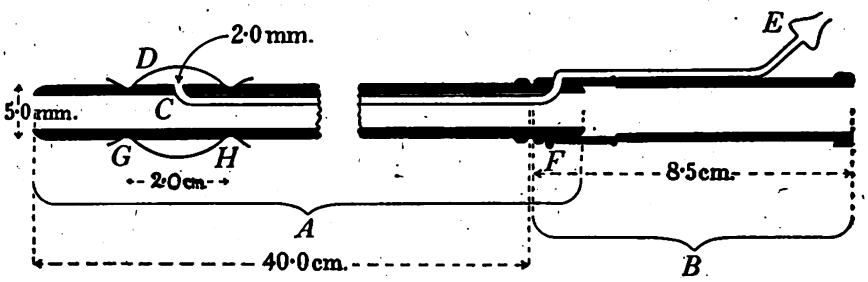

FIG. 2.—Special bronchoscope (explanation in text).

The methods adopted by all these workers for registering intrabronchial alterations in volume can be severely criticised. In addition, the animals were always under very abnormal conditions of working, and, in many cases, the organs were entirely isolated. The method given below as well as being very sensitive is largely free of these objections.

EXPERIMENTAL METHOD

The following account is taken substantially from the original paper (Ellis and Livingston 1935). The principle involved is merely the insertion of a balloon into a given portion of a dog's bronchus through a special bronchoscope and the recording of its volume changes, which reflect the changes in calibre of the bronchus.

Apparatus.—The special instrument devised (Fig. 2) consists of a brass tube 48·5 cm. long and 4·0 mm. external diameter, carrying an inner tube of 2·0 mm. external diameter. One end of this latter tube opens, as shown, into a cylinder of rubber (D) attached at G and H to make a balloon, and the other end is drawn outwards into a side tube (E), leading to the recording apparatus. The instrument is constructed in two sections (A and B) connected by a bayonet joint (F) in such a way that, when it is fully closed, the lumen of each tube is continuous and airtight, as proved by blowing air through E, which inflates the balloon, and through the main tube, which does not do so. At first, it was thought that the section (C) between G and H should be flexible, and in the earlier instruments it was constructed of gum-elastic. Subsequently this was found not to be necessary and the thickness of the gum-elastic, encroaching on the lumen, was a disadvantage. Later instruments were therefore made entirely of thin brass, 5·0 mm. in external diameter, and this was finally reduced to 4·0 mm. The outer tube can be closed off, but is usually allowed to remain open to permit of free circulation of respiratory air in the portion of the lung distal to the balloon, an essential difference from the method employed by Roy and Brown (1885).

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The balloon is made from a cylinder of thin sheet rubber, using rubber cement, and fastened to A with silk threads at G and H. The cylinder is made of larger bore than the bronchial tube so that it can be well inflated with air and yet not exert an elastic pressure on its contents. This also ensures that a large area of the balloon will be in contact with the walls of the bronchus for the reception of movements. Calculation shows that a change in calibre of the bronchus from 8·0 mm. diameter to 5·0 mm. results in a change in volume of about 0·6 c.cm. in a segment 2·0 cm. long (G H of Fig. 2). A sensitive recording apparatus is thus essential. A volumetric method—through thick-walled rubber tubing to a small Brodie bellows equipped with an aluminium writing point—was found satisfactory in registering these small changes. In calibration, the introduction into the recording system of 0·1 c.cm. of air by a hypodermic needle inserted obliquely through the wall of the rubber tubing caused an elevation of the writing point of about 1·0 cm.

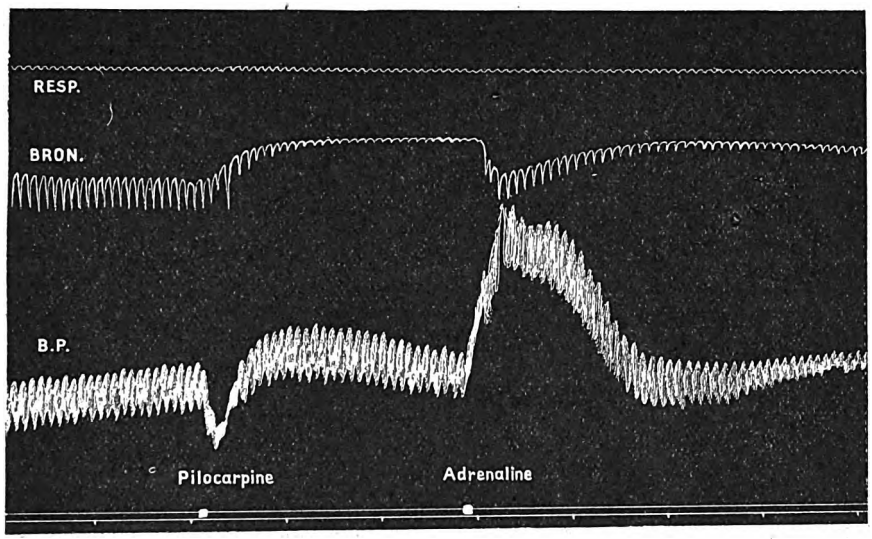

FIG. 4.—Transitory adrenaline effect on bronchus already constricted by pilocarpine.

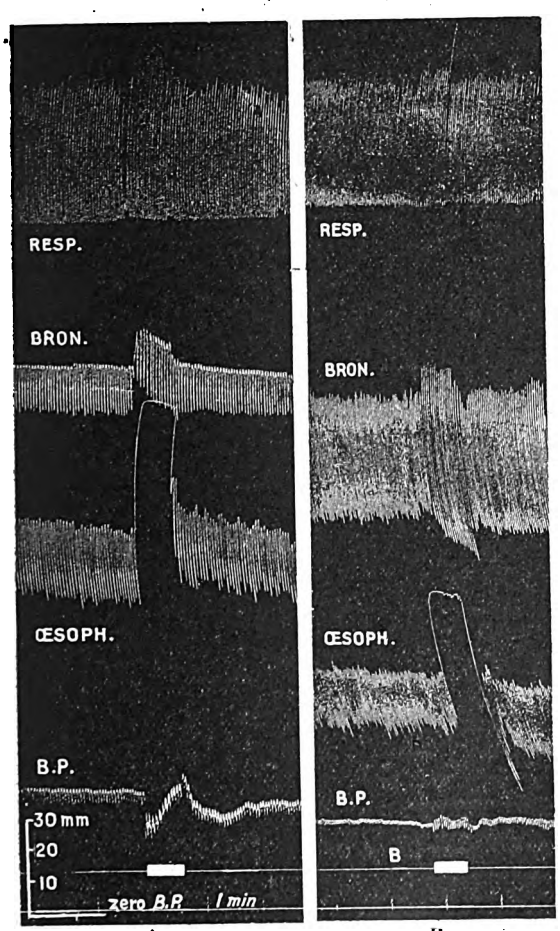

FIG. 5.—Vago-sympathetic stimulation (A) before, and (B) after atropine.

Material.—Dogs varying in weight from 7·0 to 9·0 kg. were found to be most suitable, larger animals requiring a longer bronchoscope than is convenient for use. Anæsthetisation was sometimes carried out with subcutaneous morphine sulphate followed by intraperitoneal sodium amytal, and sometimes with intravenous chloralose (0·1 g. per kg. body-weight). A few animals were decerebrated.

Method.—After inspection of the bronchial tree with a Jackson bronchoscope, 30·0 cm. long and made with a "full lumen" of 8·0 mm. diameter to facilitate the introduction of the special instrument described above, the distal portion of the latter (A) is moistened with water and introduced to the desired position through the bronchoscope which is then withdrawn over it. The proximal piece of the instrument (B) is affixed, and the inner tube connected with the Brodie bellows which is always tested for leaks immediately before use. A side tube with a clamp is used to inflate the cylinder and distend the bellows. A simultaneous record of respiratory movements is taken by a pneumatic stethograph applied to the surface of the chest wall communicating with a Brodie bellows. A blood-pressure tracing is obtained from the left femoral artery with a mercury manometer.

Examples of records obtained with the apparatus showing its delicacy are given in Figs. 3 and 4 where the changes produced by adrenaline and pilocarpine are seen. Fig. 3 shows an adrenaline effect which can be obtained as a routine with this preparation, but which has never previously been clearly demonstrated. From this result it can be deduced that the sympathetic nerves have some power in maintaining the bronchial lumen at a given diameter. Fig. 4 gives a striking picture of the transitory effect of adrenaline on an already constricted bronchus. In Fig. 5, results of stimulation of the peripheral end of the vago-sympathetic trunk before and after the administration of atropine shows that the sympathetic fibres are overweighted by the parasympathetic ones, but exert their dilating effect when the latter are put out of action. A record from the interior of the œsophagus is shown in these three figures obtained with an instrument similar to that used in the bronchus. The very great contraction of the œsophagus on vagal stimulation is striking. It also occurs, but to a lesser degree, after atropine, and is perhaps due to the spread of current to the striped muscle walls of the tube. This point will be referred to later.

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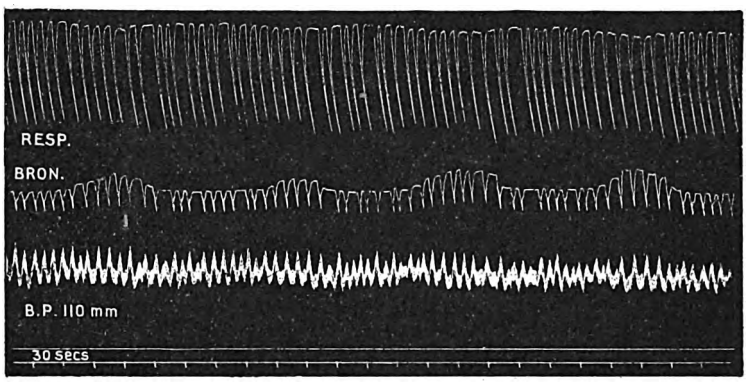

FIG. 6.—Simultaneous contraction waves in bronchus, chest wall, and blood pressure.

RHYTHM AND TONE

All the records show that the bronchus contracts and dilates rhythmically and that there is also an identical rhythm in the tracings of the thoracic wall movements and the blood pressure. In Fig. 6 another and slower type of rhythmic movement is seen, also reduplicated in the thoracic wall and blood-pressure tracings. Previous workers, particularly Einthoven (1892), Dixon and Brodie (1903) and Bullowa and Gottlieb (1920 and 1922), have described "peristaltoid" movements in the bronchi, and have compared them with the peristaltic waves of the small intestine. The methods employed by the first two workers are technically unsound and have been discussed and criticised by Trendelenburg (1912) who was unable, in his experiments, to reproduce their results. No records of the third group of workers show any definite movements of this sort, and their deductions were chiefly made from observations on the fluoroscopic screen of the behaviour of the bronchi when filled with iodised oil.

There is some indirect evidence that there are waves of relaxation and contraction. Lewis (1924), working with tissue-culture preparations of chick embryo lung, noticed rhythmic contractions and also a wave-like notion passing along the tubes. Henderson, Chillingworth, and Whitney (1915) demonstrated that the volume of the "dead space" (the total capacity of the interior of the bronchial tree) varies from time to time, sometimes rhythmically with a period of several minutes.

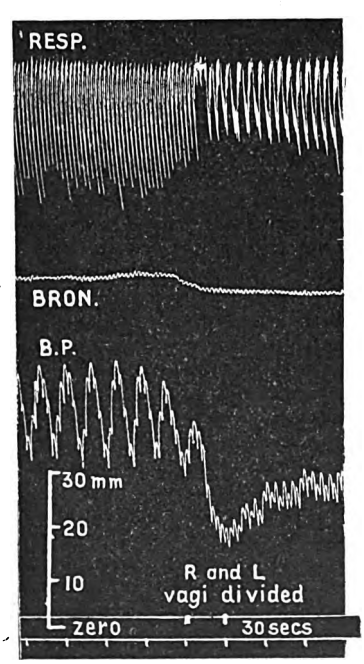

FIG. 7.—Hypertonic effect of parasympathetic nerves after division of vagi. Large part of chest wall resected, diminishing movements.

The postulate of peristalsis requires more precise evidence than that noted above, since it must be shown that a wave of relaxation is immediately followed by a wave of contraction. The tracing in Fig. 6 merely indicates that a contraction occurs, and other similar records show either contraction or relaxation from a certain level, but never both. The parallel variation in the chest wall and blood-pressure tracings suggest that all these effects may be manifestations of rhythmic changes in the higher centres. An accurate investigation of peristaltic movements would require records from two fixed points in the same tube. This has not been obtained, but the above analysis of records which have been obtained from one fixed point indicates that the phenomenon is more in the nature of a rhythmic increase or decrease in tone.

It has been mentioned above and demonstrated in Figs. 4 and 5B that the administration of adrenaline or the stimulation of the sympathetic fibres in the vago-sympathetic trunk relaxes the bronchi, that is, decreases the tone. (In a few experiments, adrenaline was found to cause an increase in tone, a finding independently confirmed by Kiese (1935), but this may be an unusual central effect of the coincident rise in blood pressure.) Pilocarpine (Fig. 4), or stimulation of the peripheral end of the vagus (Fig. 5A) causes an increase in tone of the bronchial muscle.

Another type of experiment to demonstrate that the parasympathetic nerves exert a constant hypertonic effect is shown in Fig. 7. A large portion of the chest wall on the right side has been removed (see below) diminishing the movements simultaneous with the respiratory ones. Division of the vagus nerves results in an immediate diminution in tone of the bronchus. The tonic effect of stimulation of the peripheral end of the right vagus under the same conditions is shown in Fig. 8. To exclude effects from without due to tetanic contraction of the striped œsophageal muscle (Ellis and Livingston 1935, and Fig. 5) the experiments were repeated with the œsophagus immobilised by being filled with plaster-of-Paris. The same results were obtained.

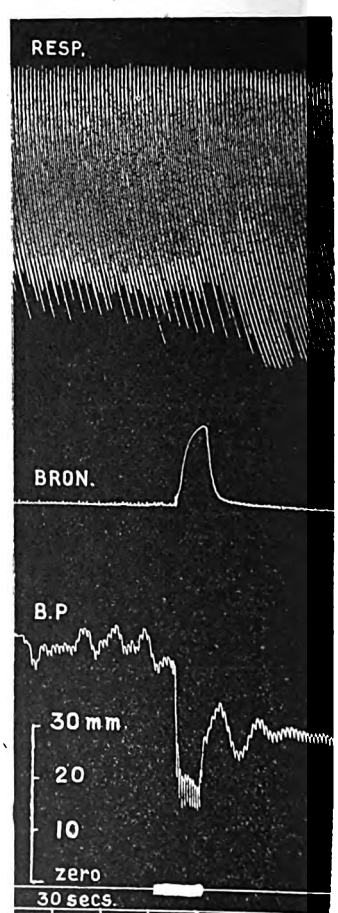

FIG. 8.—Same condition as Fig. 7. Stimulation of peripheral end of right vagus.

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REFLEX EFFECTS

It has been observed by many bronchoscopists (Clerf 1927) that in certain cases of asthma between actual attacks there is increased tone in the bronchial tree, as evidenced by the excessive occlusion in the expiratory phase of respiration. Examination of these cases often reveals, in the smaller tubes, a little very viscid secretion. Mechanical removal of this frequently leads to a temporary cessation of attacks, and needs to be repeated at intervals of increasing length until no longer required. The preparation of an autogenous vaccine from the secretion is sometimes possible and often effects a cure, another item in the proof of its abnormality. It is difficult to escape the conclusion that the secretion is acting as a local irritant to the bronchial mucous membrane and initiating the sensory arc of a reflex broncho-constriction. This results in hypertonus of the bronchial muscle, which occasionally becomes maximal as an asthmatic seizure. It has not been possible to demonstrate experimentally this reflex from the smaller bronchi, but it forms part of a more generalised reflex of familiar occurrence—the protective cough following the inhalation of a foreign body or irritant substance into the bronchial tree. The sense of constriction that persists for some time afterwards is probably due to hypertonus of the bronchial tubes. A similar effect occurs in some cases of bronchitis.

The upper part of the respiratory tract consists chiefly of the nasal cavities. Most of the lining mucous membrane of these cavities in man is concerned with respiration and supplied by the trigeminal nerve. Although the lining mucosa of the dog is chiefly olfactory it is supplied, for common sensation, also by the trigeminal nerve. No controlled experiments in the human have been carried out that show any clear relationship between the nasal mucosa and the bronchial muscle, although there is a good deal of hypothesis based on clinical observations. As a negative finding it can be stated that stimulation of the normal nasal septum or inferior turbinals with a faradic current which is just unpleasant when placed on the tongue gives rise to no sense of retrosternal constriction, but it is not known how much bronchial contraction is necessary to produce such a sensation.

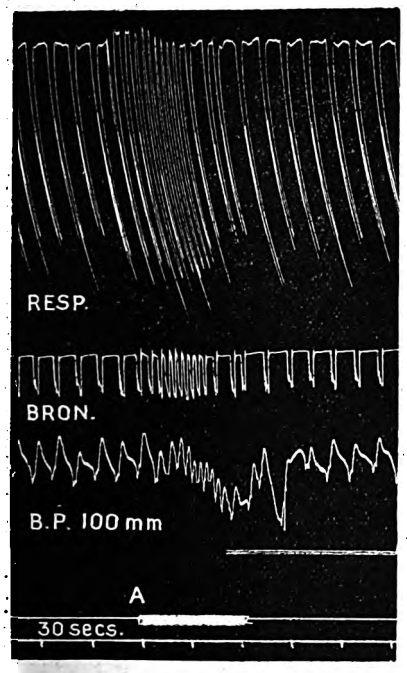

FIG. 9.—Respiration quickening. Effect of septal stimulation (ammonia) in vagotomised animal.

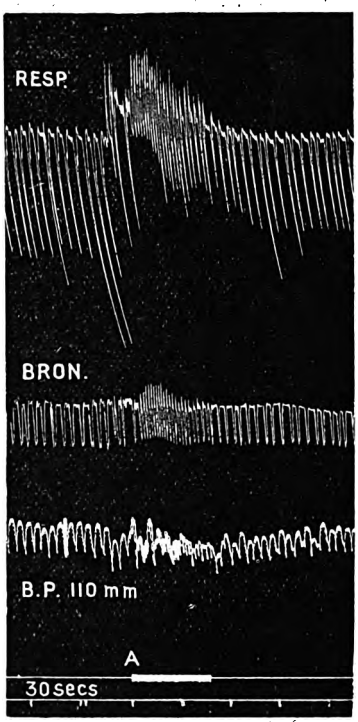

FIG. 10.—Hypertonus and quickening following stimulation of the nasal cavities with ammonia.

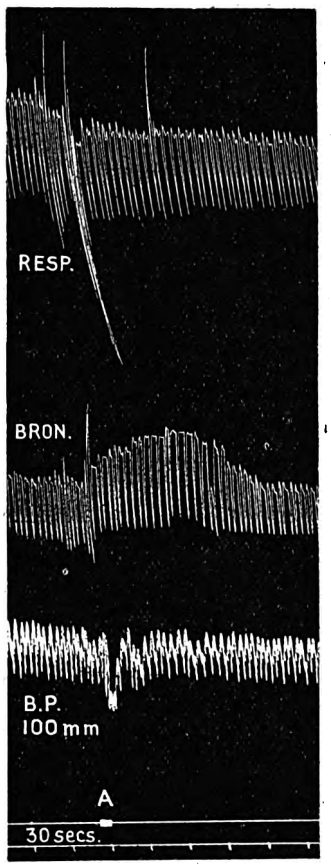

FIG. 11.—Hypertonus only following stimulation of the right side of the septum with a faradic current.

The classical animal experiments were performed by Kratschmer (1870) who showed that the effect of irritant gases on the nasal mucous membrane is a cessation of the respiratory movements in the expiratory phase, and also that the trigeminal nerve is the sensory arc of the reflex. Sandmann (1890) declared that a broncho-constriction occurred, since there is an increase of the intratracheal pressure during this stimulation. Houssay and Cruciani (1929) working with a Heymans preparation of cross-circulation dogs, measuring bronchial movements by Jackson's method (see above) and stimulating with ammonia vapour, came to the same conclusion.

In a series of experiments using my direct method of recording alterations in bronchial tone very variable results were obtained.

The nasal mucosa was stimulated with the faradic current or irritant gases. When the former was used, the nasal cavities were inspected with a head mirror and a speculum and areas selected with precision. When the latter were used, the larynx—and thus the more distal parts of the respiratory tract—was sometimes separated from the nasal

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cavities by a proximal ligature. On other occasions, the nasal cavities were isolated by firmly packing-off the post-nasal space with gauze.

Where positive changes were observed they could be divided into two groups. In the first group, the striking feature was the increase in respiratory rate, and this occurred with both forms of stimulation. It is independent of the vago-sympathetic trunks, as is shown in Fig. 9, and must be a central radiation down the cord to the spinal nerves supplying the great muscles of respiration (the motor arc). In the second group, alterations in bronchial tone occurred with or without concurrent increase in the respiratory rate. Fig. 10 is an example of both changes, that of hypertonus being pronounced, and they disappear with cessation of the stimulus (Ellis 1936). In Fig. 11, hypertonus alone has occurred and lasted several minutes longer than the duration of the stimulus.

An interesting result is shown in Fig. 12 where an area on the left side of the septum was stimulated with a faradic current and caused a prolonged bronchial constriction. Bilateral vagotomy abolished the reflex. This is proof that the naso-bronchial reflex is not a homo-lateral phenomenon as has been widely held, but is certainly contra- and probably bi-lateral. The evidence for the old belief was chiefly clinical, and the observations not very reliable. Unilateral asthma due to nasal polypi on the same side is postulated, but no post-mortem material has been produced to support the theory, and no convincing experimental evidence.

Reflexes from other sites were explored, and special attention was paid to the sensory nerves. Only on rare occasions were bronchial changes observed independent of respiratory ones. Such an occasion gave rise to Fig. 13, where the central end of the sciatic nerve was stimulated with an electric current. A slight increase in the amplitude of the respiratory movements occurred and this was paralleled in the bronchus where also there was a slight rise in tone of longer duration than that of the stimulus.

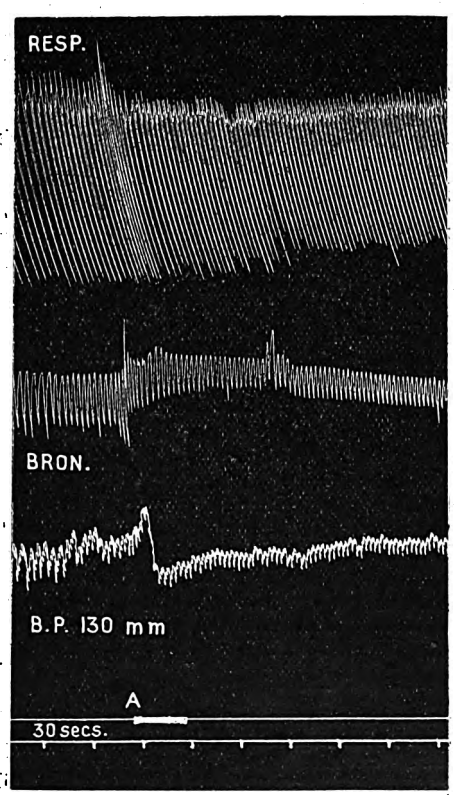

FIG. 12.—Faradic stimulation of left side of septum causing prolonged bronchial constriction: abolished by bilateral vagotomy.

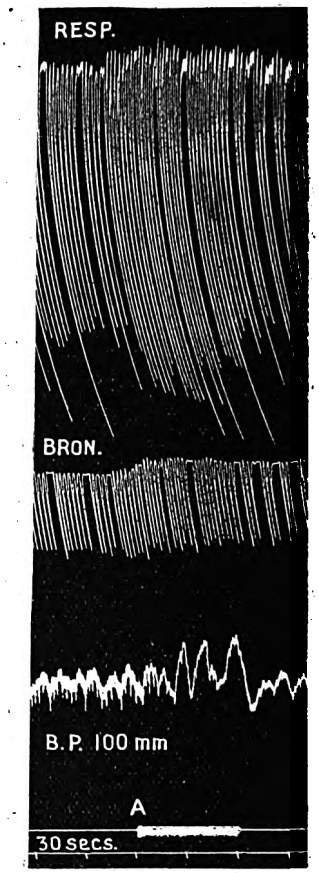

FIG. 13.—Effect of stimulating central end of sciatic nerve; slight increase in tone of bronchi and increased amplitude of respiration.

RHYTHMIC CHANGES IN CALIBRE

The foregoing account has been concerned with the demonstration that there is a normal tone in the bronchial tree which is subject to spontaneous rhythmic variation and can also be influenced reflexly. I have already mentioned, and it will have been noted on the tracings used in illustration, that the lumen of the bronchus undergoes more frequent changes than those with which I have so far been concerned and these will next be discussed.

The direct method of recording alterations in diameter of the bronchi has proved ideal for the analysis of the changes in calibre which have long been thought to occur during respiratory movements. Theoretical deductions from the structure of the tubes and some of the earlier experiments and observations have been discussed above. In my records it is clearly shown that the bronchial lumen widens during the inspiratory phase and narrows during the expiratory phase of respiration, and that these alterations in bronchial calibre are synchronous with the respiratory movements and always accompany them. The mechanism of these rhythmic changes in calibre has been fully investigated (Ellis 1936), and only a short account will be given here.

There are three possible sources for the production of these movements:—

(1) An intrinsic rhythm of the smooth muscle in the walls of the tubes.

(2) The result of nervous impulses carried in the vagus or sympathetic nerves.

(3) A mechanical result of chest wall movements, the dilatation being purely passive.

The first hypothesis was negatived by Trendelenburg (1912) who used isolated strips of ox and sheep bronchial muscle. He found no evidence of spontaneous contractile or expansile power. Indeed, rhythmic contractions at the rate of fifteen a minute would be a property of smooth muscle not found elsewhere in the body.

The second hypothesis has been stated by Starling (1936), where the possibility of active bronchial muscle contraction in the expiratory phase governed by nervous impulses is advanced. There is some indirect supporting evidence. Sensory spindles are

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found among the fibres of the bronchial muscle (Larsell 1923, and Gaylor 1934), and sensory fibres leave the lungs (Ranson 1921). In these fibres, at each inspiratory movement, there are action currents (Adrian 1933) that resemble the discharges from stretch receptors in voluntary muscle. There may thus be a reflex arc with a stretch impulse on the sensory and broncho-constriction on the motor side. I have shown, however, that after bilateral vagotomy (broncho-constrictor nerves) the alterations in calibre become greater. Also—if artificial respiration is given—division of the spinal cord in the lower cervical region and consequent abolition of broncho-dilator impulses leaves the bronchial movements unaffected. A further point against this theory is that made against the previous one—the excessively high rate of smooth muscle contraction.

The third hypothesis was investigated in two ways. An isolated lung preparation was suspended in a Drinker respirator and a record from the right bronchus taken in the usual way while the lungs were regularly inflated and deflated. Such a record was indistinguishable from those obtained in the normal way, showing that it is possible to reproduce the movements mechanically. In another series of experiments bronchial movements were recorded as follows: (*a*) in the intact animal; (*b*) after resection of a large portion of the right thoracic wall and bilateral phrenicectomy; (*c*) after right and then bilateral vagotomy; and finally (*d*) after section of the spinal cord at the level of the occipito-atlantal space. The animal is kept alive after the last procedure by a special method of artificial respiration of the left lung. It was seen that each operation reduced the amount of movement of the thoracic cage until it was rendered motionless, and the bronchial movements were reduced in amplitude proportionately. The same result was obtained by dividing the vagi and spinal cord first of all. In this case the thorax became motionless and the bronchial movements ceased, and the tracings were unaltered by subsequent resection of the chest wall. The rapid bronchial rhythm was thus seen to be an exact counterpart of that of the thoracic cage and to be extrinsic. The reflex arc initiated by the stretch receptors in the bronchial muscle is therefore not concerned with rhythmic bronchial movements, but may assist in the control of respiratory movements.

CONCLUSION

The bronchial muscle is concerned entirely with the maintenance of a moderate tone, and there seems to be no rapid, rhythmic function assignable to it. The larger bronchi are able to resist changes of shape, especially compression, imposed upon them by the respiratory movements of the thorax because of the plaques of cartilage in their walls. In the unsupported smaller bronchi, the muscle forms a relatively larger proportion of the wall, and, by its tone, prevents the expiratory movements from occluding the lumen of the tubes. Its anatomical arrangement is admirably designed for this purpose. The above discussion is based upon experiments on the larger bronchi, and the behaviour of the smaller ones is deduced by analogy. Such an assumption is not unreasonable, as the bronchial muscle is a continuous network with the same nerve-supply throughout and can reasonably be expected to behave as a unit. The total capacity of all the bronchioles is large, and, as the calibre of these tubes is governed by the muscle in their walls (which also controls the openings into the air sacs), it can easily be realised that small changes in the tone of this muscle can lead to considerable alteration in the volume of respired air. Therefore, in spasmodic bronchial disease it is not necessary to postulate an active contraction of the bronchial muscle—a small increase in tone will produce far-reaching effects. It is important both to appreciate this and to know the circumstances in which it can occur, some of which have been described in this paper.

SUMMARY

(1) The anatomy of the bronchial tree with special reference to the myo-elastic layer is described.

(2) Theoretical considerations of its function are briefly discussed.

(3) A method of directly recording changes in the calibre of the bronchi in the dog is described.

(4) It is shown, using this method, that the tubes are in a state of constant tone which sometimes undergoes slow, rhythmic variations.

(5) The tone is reflexly modified from many sites both within and outside the respiratory system.

(6) Rhythmic changes in calibre of the bronchi synchronous with respiratory movements are demonstrated. Investigation of their mechanism shows that they are produced passively by the respiratory thoracic movements.

(7) The relationship of asthma and other spasmodic bronchial diseases to these experimental findings is indicated.

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BIRMINGHAM HOSPITALS CONTRIBUTORY ASSOCIATION.—Mr. Robert Bernays, M.P., parliamentary secretary to the Ministry of Health, addressing the annual meeting of this association last week, said that in the ten years of its existence it had collected and distributed a sum not very far short of 3 million pounds. The hospital savings movement had done as much as any single factor to secure the strong position the voluntary hospitals occupied to-day. It provided an organised system of insurance and the profits went, not to shareholders, but to persons who were unable to pay even the small weekly contributions which the associations collected. It was furthermore a valuable link between the voluntary and the municipal hospitals.

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GOUT *

By LESLIE C. HILL, M.D. Birm., M.R.C.P. Lond.

PHYSICIAN TO THE DEVONSHIRE ROYAL HOSPITAL AND TO THE BUXTON CLINIC FOR RHEUMATISM

To attempt here to review the whole problem of gout would be virtually impossible. I will therefore make a critical survey of 93 cases of gout treated during the last three years, rather more than half of which were under my own care, with the object of establishing, at any rate to my own satisfaction, the relative importance of factors in the clinical history, physical examination, and biochemical investigations, which together form a composite picture of gout. On the basis of these findings I hope that it may be possible to throw some light upon the existence of abarticular gout.

Ætiology

The study of contemporary publications reveals a great divergence of opinion in the matter of the relative frequency of gout to-day, and this variability is also evident in the statistics published during the last 50 years. The Devonshire Royal Hospital records since 1886 (Table I) exemplify this point very clearly.

TABLE I—INFLUENCE OF STAFF CHANGES AND THE INTRODUCTION OF BLOOD URIC ACID ESTIMATION ON THE NUMBER OF GOUT CASES ADMITTED TO THE DEVONSHIRE ROYAL HOSPITAL

Period.	Total cases admitted.	Gout cases. M.	Gout cases. F.	Percentage of total.
1886–1890	12,114	158	..	1·3
1891–1895	12,497	400	..	3·2
1896–1900	14,224	324	20	2·4
Five new appts. to staff.				
1901–1905	15,836	743	91	5·26
1906–1910	18,019	511	62	3·18
1911–1915	20,702	784	120	4·36
1916–1920	21,557	722	362	5·0
Six new appts.				
1921–1925	17,829	408	213	3·48
Blood uric acid estm. introduced.				
1926–1930	19,219	392	121	2·66
1931–1935	18,833	427	94	2·76

M. = males; F. = females.

INCIDENCE

A considerable rise in the number of cases of gout is noticeable from 1900 onwards until about 1920, to be followed by a slight fall. During 1916–20 as many as 5 per cent. of the patients admitted were regarded as suffering from gout, and over a third of these were women—most of us who have had experience of the disease would be sceptical of this high proportion in women. Further investigation revealed an interesting relationship between variations in the percentage of gout and appointments to the honorary staff. Thus about 1900 a big change occurred, five new appointments being made. Similarly round about 1920, when the number of cases of gout began to fall, another big staff turn-over occurred, on this occasion six new members being added. It seems probable from the records that the high percentage of gout in women during 1900–25 may have been influenced by a tendency on the part of one or two members of the staff at that time to diagnose as gout cases of chronic villous synovitis of the knees in women, so common at or round about the menopause as to be occasionally designated hypoglandular or menopausal arthritis. The third important factor influencing the figures was the introduction of the blood uric acid estimation in 1923.

From this brief review it is possible to appreciate the danger of accepting statistics and the desirability of establishing more clear-cut standards for diagnosis in this disease.

TABLE II—HEREDITY

All cases.	Women (21).	Men (72).	Total (93).	Per cent.
Family history of gout	11	30	41	45
Family history of fibrositis	4	10	14	15
No family history	5	32	37	40
Abarticular.	**Women (5).**	**Men (10).**	**Total (15).**	**Per cent.**
Family history of gout	3	6	9	60
Family history of fibrositis	1	2	3	20
No family history	1	2	3	20
Mixed.	**Women (4).**	**Men (17).**	**Total (21).**	**Per cent.**
Family history of gout	3	6	9	42·8
Family history of fibrositis	1	3	4	19·0
No family history	0	8	8	38·0

HEREDITY

In no condition is the importance of heredity more stressed than in gout. Heine has particularly emphasised the hereditary nature of the disease and quotes families in which it has appeared as a dominant characteristic for 400 years. Many writers, including Llewellyn, consider that an hereditary factor is invariably present. The fact that the morbid potentialities may remain latent for a generation probably accounts for the absence of a family history in many of the cases. There is a family history of gout in 45 per cent. of my cases and of fibrositis in a further 15 per cent. (Table II). The percentage was higher, but not significantly so, in the women.

These figures are somewhat lower than those quoted by such authorities as Garrod, Roberts, and Luff, but theirs related to private patients, while the majority of mine are of the hospital type in whom reliable history is more difficult to obtain. The inherited predisposition may be in the nature of a transmitted allergic state. Neither by observation nor by questionnaire have I observed any abnormal tendency to allergic manifestations among these patients; but this is merely an impression.

TABLE III—OCCUPATION OF 72 MEN SUFFERING FROM GOUT

Painters	2	Shopkeepers	4
Labourers	10	Factory hands	14
Miners	6	Business and professional men	15
Publicans	7	Others	7
Clerks	7		

OCCUPATION

No one particular occupation stood out prominently in association with gout (Table III). The

* Delivered before the International Congress on Rheumatic Diseases, Bath, on April 2nd.

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relatively high percentage in publicans supports the orthodox attitude towards excessive alcoholic intake. The figure of 6 miners affected may be considered low in relation to the 500 odd who are treated annually in the Devonshire Royal Hospital. The free sweating set up by heavy manual work in a warm atmosphere with promotion of free circulation may explain the relative infrequency of gout in this occupation.

TABLE IV—AGE OF ONSET

—	Men.			Women.		
	All cases (72).	Abarticular (10).	Mixed (17).	All cases (21).	Abarticular (5).	Mixed (4).
Below 25	2	—	—	2	—	—
25–35	6	3	2	1	—	—
35–45	24	4	3	6	1	1
Above 45	40	3	12	12	4	3

AGE

Gout is essentially a disease of the middle and declining years of life (Table IV). There is no example in this series—and I have never met one in practice—of classical gout before the age of puberty. Many, however, have been reported, including an account by Garrod of 2 girls both under 10. Only 3 women in my series showed symptoms before the menopause, and of these, 2 of the classical type were associated with advanced renal disease. One was an example of generalised tophaceous gout, rare nowadays even in men. In 2 patients the acute attacks coincided with the menstrual periods. In the male series 2 cases began before 25 years, 6 before 35, and 32 before 45. So that in considerably more than half of the cases the disease began after 45; if the figures for the women are included, the proportion is still higher.

TOPHI

The presence of tophi is widely regarded as unequivocal evidence of gout. They are said to be more common in men than women, particularly the multiple variety.

TABLE V—PRESENCE OF TOPHI IN 40 CASES OUT OF 93 (43 PER CENT.)

Site.	Men (32).	Women (8).	Total (40).	Per cent.
Ears	30	5	35	87·5
Olecranon ..	4	3	7	17·5
Fingers ..	3	2	5	12·5
Toes	3	1	4	10·0
Eyes	3	1	4	10·0

Tophi in various situations (Table V) were found in 32 men and 8 women. The helix of the ear was the commonest situation; others included the posterior surface of the pinna, the olecranon bursa, eyelid, conjunctiva, fingers, and toes. In 2 men acute attacks occurred in the ear which became intensely congested, swollen, and bright red in colour; instead of pain, a sensation of burning and irritation were complained of and insect bite was suspected before the true diagnosis was appreciated. In one instance where no previous deposit had been noted in that region, a tophus was found after the attack, while the other was followed immediately by a classical outburst in the great toe.

From my figures I am unable to agree with those authorities who state that tophi are relatively very uncommon in women.

Diagnosis and Grouping

The cases have been grouped under three headings: articular, abarticular, and mixed gout (Table VI). Further subdivision into acute and chronic articular gout would have postulated a purely arbitrary standard.

The articular group contains the typical outbursts in the great toe, the less common varieties which start in the larger joints (knees, elbows, &c.), and the rarer polyarticular manifestations so liable to be confused with rheumatoid arthritis. Apart from the classical attacks in the great toe the commonest sites are foot, hand, knee, elbow, shoulder, hip—in that order. Until recently I had been reluctant to diagnose gout in the presence of bilateral swellings of the small joints of the fingers (perhaps with spindling) even when the course of the disease, a positive response to colchicum, and a raised blood uric acid suggested it, and even when a complete recovery followed treatment—an important point in diagnosis. I had the privilege recently of seeing, in Prof. F. J. Lang's laboratory at Innsbruck, microscopical slides of joints showing pathological changes hitherto regarded as typical of rheumatoid arthritis—synovial proliferation with granulation and pannus formation—associated with a heavy deposit of sodium biurate in the cartilage and synovial fringes.

TABLE VI—DIAGNOSIS

—	Men.	Women.	Total.	Per cent.
Articular gout	45	12	57	61·2
Classical	21	4	25	
Various joints ..	22	5	27	
Rheumatoid	2	3	5	
Abarticular gout ..	10	5	15	16·1
Mixed gout	17	4	21	22·5
Associated with nephritis	5	4	9	9·6

In this series there were 5 examples of this type closely resembling rheumatoid arthritis. Possibly on close examination the spindling is not so well marked and the tendency to wasting of the small muscles and ulnar deviation is lacking. Of the patients 3 were women, and in view of the relatively small numbers it would be unwise to do more than suggest that this rare manifestation of gout is commoner in women than in men and may be associated with some particular occupational strain.

The 15 cases of abarticular gout, of which more will be said later, are virtually all examples of gouty fibrositis and neuritis. I have had no opportunity of studying the effects of gout on other systems—cardiovascular, digestive, ocular, &c.—since such cases did not present themselves in my private or hospital practice. This figure of 15 is small in comparison with the number of cases of fibrositis treated each year (1200 in 1935–36) in the Devonshire Royal Hospital.

RENAL FACTOR

In a small series of 10 consecutive cases of gout the renal function was carefully estimated.

In only 1 case was there any evidence of deficiency and this was too small to be significant since the patient was well advanced in years and had other evidence of arterio-sclerosis. In 9 cases (5 men, 4 women) out of the total of 93, nephritis with serious

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renal inefficiency was noted. Albuminuria, casts, nitrogen retention, and a standard clearance of less than 18 (35 per cent. of normal) were required for this diagnosis. The attacks in these patients differed in no way from the others, the response to colchicum and hydrotherapy being equally satisfactory.

Unfortunately I have had no opportunity of confirming or rejecting Llewellyn's statement that tophi are never found in chronic nephritis in the absence of clinical gout.

ONSET OF ATTACKS

Not every attack is as dramatically sudden and clear-cut as that described by Sydenham. Without precise data I have an impression that in more than half of the male cases the onset was sudden, whereas in women the reverse obtained, gradual onset being more common. Table VII shows the overwhelming

TABLE VII

	ONSET OF INITIAL ATTACK					ONSET OF SUBSEQUENT ATTACKS				
All cases.	Men (63).	Wom. (17).	Total (80).	Per cent	All cases.	Men (63).	Wom. (18).	Total (81).	Per cent
Day	11	2	13	16·2	Day	15	2	17	20·9
Night	52	15	67	83·7	Night	44	10	54	66·6
					Day & night	4	6	10	12·3
Abarticular.	Men (9).	Wom. (5).	Total (14).	Per cent	Abarticular.	Men (9).	Wom. (5).	Total (14).	Per cent
Day	2	—	2	14·2	Day	4	—	4	28·5
Night	7	5	12	85·7	Night	4	2	6	42·8
					Day & night	1	3	4	28·5
Mixed.	Men (11).	Wom. (4).	Total (15).	Per cent	Mixed.	Men (11).	Wom. (4).	Total (15).	Per cent
Day	5	—	5	33·3	Day	6	—	6	40·0
Night	6	4	10	66·6	Night	4	3	7	46·6
					Day & night	1	1	2	13·3

tendency for the initial attack to occur at night both in men and women. This was the case in 66 patients out of 79 from whom a definite history could be obtained. In subsequent attacks the incidence at night was not so great.

There are two theories to explain this nocturnal tendency. The first suggests that slowing of the circulation during the night favours precipitation of urates in the cartilage by way of the epiphysis; the second explains it on the basis of an increased vagotonia and slight alkalosis. There is some experimental evidence to show that vagal stimulation increases renal permeability to uric acid, and vagal tone is always increased at night. As I shall hope to show later, my figures fail to reveal any such alkalosis in a single case, and I have been unable to obtain any very convincing evidence of this raised vagal tone, so that I am disinclined to accept this theory. Since uratic deposits are heaviest in the superficial layers of the joint cartilage and since the hypertrophied synovial membrane is often encrusted with urates, it is probable that such deposits take place from a synovial fluid in which the concentration of uric acid may be significantly greater than it is in the blood. Similar conditions may obtain in tendons, tendon sheaths, bursæ, &c.

SEASON

The seasonal tendency was noted (Table VIII) in 60 men and 14 women from whom a satisfactory history could be obtained. Spring is by far the commonest season for acute attacks, autumn being a rather poor second. This is in strict accordance with accepted ideas.

TABLE VIII—SEASONAL INCIDENCE OF ATTACKS OF GOUT

All cases.	Men (62).	Wom. (19).	Total (81).	Per cent.
Spring	24	7	31	38·0
Summer	4	2	6	7·4
Autumn	11	5	16	19·7
Winter	6	3	9	11·0
Spring and autumn	14	2	16	19·7
Spring and winter	3	—	3	3·7
Abarticular and mixed.	**Men (19).**	**Women (8).**	**Total (27).**	**Per cent.**
Spring	13	3	16	59·2
Summer	2	—	2	7·0
Autumn	1	4	5	18·0
Winter	1	—	1	3·7
Spring and autumn	2	1	3	11·0

BIOCHEMICAL TESTS

Sedimentation-rate.—Tests were carried out by the centrifuge tube method, which in our hands has proved more correct and more constant than any other. The figures (Table IX) show the level at the end of one hour expressed as a percentage. Acute, subacute, chronic, and latent stages are represented and the figures in consequence have no absolute value. It will be noted, however, that in more than a half the level was above 70 per cent. This contrasts with a group of 50 cases of rheumatoid arthritis examined recently in rotation in which the average was between 50 per cent. and 55 per cent. In many cases the lower levels were found during the acute stage. The figures thus support my own impression of an increased rate during the acute attack, and a rapid

TABLE IX—BLOOD SEDIMENTATION-RATE

(Centrifuge tube method, 1 hour reading)

All cases.	Men (65).	Women (19).	Total (84).
Below 50 %	4	4	8
50–70 %	23	10	33
Above 70 %	38	5	43
Abarticular.	**Men (12).**	**Women (4).**	**Total (16).**
Below 50 %	2	—	2
50–70 %	3	1	4
Above 70 %	7	3	10
Mixed.	**Men (16).**	**Women (4).**	**Total (20).**
Below 50 %	—	—	—
50–70 %	6	3	9
Above 70 %	10	1	11

return to normal with recovery. Later, in the more chronic stages, there is not the same tendency for a return to normal. A rapid improvement in the sedimentation-rate suggests the possibility of either gout or subacute rheumatism and warrants a confirmatory blood uric acid estimation.

Blood uric acid estimation.—This was carried out by the Folin direct method except in a few cases. In about 90 per cent. of the cases the level was 4·5 mg. per 100 c.cm. or over (Table X). I regard as definitely abnormal any figure above 4·0 mg. in men or 3·75 mg. in women and anything within 0·25 mg. of these figures as suspicious. I am not prepared to diagnose gout

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in the absence of tophi where the blood uric acid by the Folin direct method is below these levels. No constant relationship between the blood uric acid and the stage of the attack is evident, but several cases showed a fairly rapid fall at the termination of the acute stage. Again, no constant relationship between the sedimentation-rate and the blood uric acid level could be demonstrated.

Blood-urea.—Apart from the 9 cases in which frank nephritis was present the blood-urea was found within normal limits. There does appear, however,

TABLE X—BLOOD URIC ACID

(Folin method)

—	Men (70).	Women (21).	Total (91).
All cases—			
Above 5·5 mg./100 c.cm.	27	4	31
4·5–5·5 "	37	16	53
Below 4·5 "	6	1	7
Abarticular—			
Above 5·5 "	1	—	1
4·5–5·5 "	10	5	15
Below 4·5 "	—	—	—
Mixed—			
Above 5·5 "	6	—	6
4·5–5·5 "	11	4	15
Below 4·5 "	1	—	1

to be a tendency for it to rise in cases of established gout with the passage of years. This is consistent with what one would expect from the effects of gout in hastening coronary as well as arterial sclerosis.

Calcium and pH content of the blood in 130 consecutive cases of gout were investigated. The *p*H was found to be within normal limits in 125, was slightly lowered in 4, and only raised in 1. This throws doubt upon the theory of alkalosis and consequently upon the vagotonia that is supposed in part to result from it. The calcium content was also normal in 25 out of 28 cases. In 2 it was a little lower during the acute stage, while in 1 it was slightly raised. That the patient was an old man with advanced atheroma and hypertension may explain this.

ASSOCIATION WITH THE MENSES AND WITH GLYCOSURIA

It has been frequently stated that the menstrual periods have an inhibitory effect upon gout. In 2 of the only 3 women in whom gout developed before the climacteric the attacks were found to coincide with the beginning of the periods. One patient, in whom the gout was apparently secondary to nephritis, had an acute attack every month while she was last under observation.

The association of gout with glycosuria has been conspicuous by its absence in this series of 93 patients. This may be due to the preponderance of the hospital class as compared with the self-indulgent, overweight type in whom the glycosuria probably represents the unconsumed surplus of carbohydrate excess. In a recent paper Violle also comments on the rarity of the association in France and considers the incidence to be less than 1 per cent. even at the spas. The statistics of Umber suggest that the association is commoner in Germany. He had 15 diabetics, all of a mild type, in a series of 278 cases of gout.

Abarticular, Mixed, and Irregular Gout

It is in the diagnosis of abarticular and irregular manifestations of gout that the greatest uncertainty and confusion prevails. Among the irregular varieties of articular gout, those simulating rheumatoid and osteo-arthritis are the most interesting and difficult. Each of the 5 cases (3 women, 2 men) of the polyarticular type closely resembled rheumatoid arthritis, but each ran a gouty rather than a rheumatoid course and showed those clinical characteristics which in association with a raised blood uric acid constitute a picture of gout. In 3 of the 5 cases colchicum was found beneficial in the acute attacks. Even so, I should have been reluctant to diagnose gout in these cases had I not seen Prof. Lang's perfect illustrations of typical rheumatoid joints side by side with microscopic sections confirming the rheumatoid intra-articular features with unmistakable uratic deposits in the cartilage and synovial fringes. But I am convinced that the number of such cases is small. They may be suspected whenever great clinical improvement and rapid rise in the suspension stability follows treatment of almost any kind. I have personally encountered no cases of typical hypertrophic osteo-arthritis which appeared to have a gouty basis either clinically or biochemically.

According to many authorities hardly any portion of the body remains immune to the ravages of gout.

DIGESTIVE SYSTEM

Virtually every form of gastric, hepatic, and colonic derangement has been attributed to gout. The sensation of weight and oppression in the epigastrium is frequently complained of during the period immediately preceding an acute attack and may be explained on the basis of a mild toxæmia or hepatic congestion. On a few occasions a history of diarrhœa during the attacks has been obtained.

CARDIOVASCULAR SYSTEM

There is fairly general agreement with Huchard's famous aphorism that gout is to the arteries what rheumatism is to the heart, and recently I was interested to hear a prominent cardiologist class gout as only secondary to syphilis as a cause of arterial degeneration, including coronary sclerosis. The various abnormalities of rhythm—bradycardia, partial heart-block, &c.—and anginal pain which have been by some attributed to gout are surely only expressions of myocardial ischæmia following coronary sclerosis and are therefore not true manifestations of gout.

NERVOUS SYSTEM

I have seen 2 cases of trigeminal neuralgia—one is included in this series—in association with a raised blood uric acid, both of which were improved by treatment with Atophan and colchicum when all else had failed. The cases of sciatica met with have always appeared to be secondary to lumbosacral or gluteal fibrositis and have been considered under that heading.

OCULAR SYSTEM

Jonathan Hutchinson described a series of cases of iritis with rather unusual characteristics which he ascribed to gout. The special features of these attacks were the sudden onset (always at night), the sensation of heat and burning rather than pain, the intensity of the injection, and the relatively short duration. Wood has recently described four cases which correspond exactly to Hutchinson's description. In one of them acicular crystals observed in sheaves by the slit-lamp were confirmed by excision. Proof of gout in these cases depended upon the unusual clinical picture as compared with ordinary acute iritis, the presence of a raised blood uric acid, the presence of crystals in one case, and above all on the improvement which followed the elimination of existing excesses of food and drink.

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SKIN

Pruritus and eczema are said to be common in gouty subjects and are undoubtedly often accompanied by a raised blood uric acid. The association has not been apparent in this series. I have not met a single case of psoriasis in combination with gout—and extremely few with rheumatoid arthritis—so that I am sceptical of any such connexion. Barber has described erythema of the palmar and plantar surfaces of the hands and feet and a hyperkeratosis at pressure sites, associated with fissuring. Brittleness of the nails with longitudinal fissuring has also been described. I have seen several instances of the hyperkeratosis and nail brittleness in this series and am satisfied that a connexion exists.

Conclusions

In this series of 93 cases of gout, 15 (10 men and 5 women) show a purely abarticular distribution and 21 (17 men, 4 women) show both articular and abarticular manifestations. In all but a single case the abarticular lesion was a fibrositis or a neuritis secondary to a fibrositis. The exception was a case of trigeminal neuralgia (associated with fibrositis elsewhere). Garrod particularly mentions the association of trigeminal neuralgia with gout. In this patient no form of treatment was of any value until, on finding the blood uric acid raised, atophan, colchicum, and diet regulation were instituted with dramatic success.

Analysis of the histories reveals the same clinical and pathological peculiarities in both classes of case. The hereditary factor is equally strongly marked; in point of fact the percentage is slightly higher. The age-incidence is about the same. It is interesting that the only woman who developed abarticular gout before the menopause was one of the two examples of acute attacks coinciding with the menstrual periods. Tophi were found in about the same proportion of cases (the numbers are too small to do more than create an impression). In Tables VII and VIII will be seen the same predilection for the spring, with autumn again second, and the same strong tendency for the initial attack to occur at night. This is not so evident in the case of subsequent attacks. The sedimentation-rate and the blood uric acid follow very closely the levels found in the whole series.

We have thus a series of cases with the same ætiological characteristics as typical gout, including a strong family history, predilection for particular season of the year, and tendency for the initial attack to occur at night. The resemblance continues in the clinical history, in the course of the disease, in the biochemical findings, and in the response to specific remedies.

They present the usual fibrositic characteristics, muscular tenderness, thickening, presence of nodules—trapezii, along the iliac crests, gluteal regions, lumbar muscles—stiffness in the fingers with periarticular thickening and tenderness. The pain is usually more acute and, as is stated above, usually comes on in bed at night when the patient is asleep. These symptoms may also be associated with transient swellings of the hands or feet without the heat and redness usually found in true gout, but associated with a sensation of heat or burning.

Unfortunately in only 8 of the 15 cases was it possible to try the effect of colchicum in the acute attack, and in 7 a rapid relief was obtained.

From the above it is reasonable to suppose that we are dealing with true manifestations of gout and not with fibrositis occurring in a potentially gouty subject. Only 15 cases have been diagnosed during the period under review out of somewhere between 800 and 1200 cases of fibrositis reviewed, so that gout would not appear to be as common a cause of fibrositis as many of the authorities suggest. It is not denied that the diagnosis may have been missed in many instances and several borderline cases were deliberately omitted.

Summary

1. Devonshire Royal Hospital statistics during the last 50 years suggest that variations in the incidence of gout may depend upon fundamental differences in the views of physicians as to what constitutes the gouty state, and demonstrate the need for more precise standards of diagnosis.

2. A family history of gout was obtained in about half of the 93 cases reviewed in this series, including those that appear to be secondary to nephritis. The higher percentages quoted in the past may be due to the fact that the term "gout" was often used by the laity to include any form of rheumatism. In the 93 cases under review no abnormal tendency to allergic manifestations was elicited.

3. Nothing definite emerged from the figures to implicate any particular occupation. The number of publicans was relatively high, while the miners affected were few in comparison with the great number treated over the same period.

4. Gout in its typical form is essentially a disease of the fourth decade onwards. There is a strong suggestion that a high proportion of those cases of gout which occur in young people are secondary to nephritis.

5. Far from being, according to Llewellyn and others, a protective against gout, the menstrual periods, from such evidence as we have in the few cases occurring before the menopause, actually appear to coincide with attacks.

6. Tophi were present in about half the cases, and there seems no justification for stressing the rarity in women. Two acute attacks of gout in the ear associated with tophus formation have been described.

7. The cases have been grouped under three headings—articular, including classical, oligo- and poly-articular gout; abarticular, associated mainly with fibrositis and neuritis; and mixed gout. Five cases of the polyarticular, rheumatoid type are included and their characteristics described.

8. There is no evidence on which to base a renal theory of origin for gout as a whole. In only 9 cases was gout apparently secondary to nephritis, and no difference either in the clinical history, course, or response to treatment was observed in these cases.

9. The tendency for the initial attack to occur at night is clearly established. Subsequent attacks are also more frequent at night than in the day, but the predilection is not so great. The circulatory theory offers a more satisfactory explanation for this than does the vagotonic theory. No evidence of a permanently heightened vagal tone nor of its precursor the raised pH of the blood could be demonstrated.

10. Spring is clearly the season of choice for gout, autumn being the next most common.

11. The sedimentation-rate varies considerably but on the whole is not greatly increased except during an acute attack. The rapid return to normal which follows clinical improvement is a characteristic feature. This is especially true in the early stages.

12. In the great majority of cases the blood uric acid is constantly raised above normal limits. In a proportion of cases the acute attack is immediately

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preceded by a rise in the blood uric acid and a fall in the suspension stability, with a rapid reversal of this process on recovery.

13. There is no essential abnormality of the blood-urea in gout.

14. In a series of 130 consecutive cases the *p*H of the blood was found to be normal in 126 and slightly reduced in 4. These findings give no support to a theory of alkalosis as a basis for a hypothetical vagotonia.

15. The calcium content of the serum was normal in 25 out of 28 consecutive cases of gout. In 2 it was slightly lowered during acute attacks.

16. There was no evidence of any common association of glycosuria with gout.

17. Since the group of abarticular and mixed gout showed the same ætiological, clinical, and biochemical features and the same therapeutic response as the more classical varieties, there appears to be no reason to deny a gouty basis for the fibrositis seen in these cases. The number of such cases, however, appears to be relatively small.

"ALCOHOLIC" BERI-BERI

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IT has long been recognised that alcoholic polyneuritis bears a close clinical resemblance to the so-called "dry" form of beri-beri. In recent years the idea has gained ground that this resemblance is more than fortuitous, and that in both diseases there is a common antecedent deficiency of vitamin B. Certain theoretical considerations advanced by Shattuck (1928) have led to an expansion of this concept to embrace a variety of gastro-intestinal abnormalities in which polyneuritis may occur—such as gastric carcinoma, chronic intestinal obstruction, and ulcerative colitis—and to include all such forms of polyneuritis under the term *secondary* beri-beri. Chronic alcoholic addiction remains the most important single precursor of this form of vitamin-B deficiency. Much work has been done, particularly in America, to confirm and elaborate this interesting hypothesis, which may now be regarded as reasonably well established (Minot, Strauss, and Cobb 1933, Blankenhorn and Spies 1935, Jolliffe and Colbert 1936, Jolliffe, Colbert, and Joffe 1936).

Beri-beri, as it is met with among rice-eating populations, gives rise in a proportion of cases to certain well-recognised, and not infrequently fatal, cardiovascular disturbances. One might reasonably anticipate that similar disturbances would be found among the cases of secondary beri-beri such as we have been considering, but from a study of the available records it appears that these symptoms are distinctly rare. Weiss and Wilkins (1936), however, have recently reported a series of such cases, arising mainly in alcoholics, several of which displayed quite severe cardiac failure, and these authors make the further claim that minor degrees of circulatory disturbance due to vitamin-B deficiency are far commoner than is generally realised.

The case of cardiac failure with polyneuritis in an alcoholic addict here recorded is very similar to those in the acute group described by Weiss and Wilkins. It is hoped to demonstrate that these cases bear a sufficiently close resemblance to "wet" beri-beri of the orient to warrant the belief that they share with it a common pathogenesis. The term "alcoholic" beri-beri seems an appropriate and convenient title for the condition.

CASE REPORT

A newspaper roundsman, aged 36, was admitted to Southmead Hospital, Bristol, on Jan. 3rd, 1937, with the following history.

For several months he had been breathless on exertion and had felt generally unwell. He tired easily, his appetite was poor, and he had lost weight. For the past three months he had complained of a dull pain in the upper abdomen and lower part of the chest, worse when carrying newspapers around. These symptoms had all become more severe during the week immediately prior to admission. Breathlessness had been particularly noticeable and his legs had started to swell. He had also suffered from a new, stabbing pain in the precordial area and at the lower end of the sternum, especially on coughing or breathing deeply.

Dietetic history.—He lived alone in lodgings, and was always very irregular with meals. He rarely ate anything at midday and his diet for the rest of the day appears to have consisted mainly of white bread and butter and tea. He ate a small amount of fat meat once a week. On two or three evenings a week he had a portion of fried fish at a local restaurant which, by his special request, was always cooked for him without batter. He ate very little vegetables or fruit, no eggs, and drank milk only in the summer time when his news round took him out to a dairy. For several years he had been in the habit of drinking 3–5 pints of beer a day. As a rule he indulged only occasionally in spirits, but during the Christmas season which had just concluded, his increasingly ill appearance had made him the object of much well-meaning generosity in this respect. For the last fortnight he had had an almost complete loss of appetite, and appeared to have subsisted on little else but alcohol.

It is evident that the above diet is grossly defective in many essential components including vitamins, particularly vitamin B. White bread and fat meat are practically devoid of this vitamin while fish is to be regarded as a poor source at best. Incidentally it may not be generally realised that the average fried fish vendor cooks his fish in oil at temperatures approaching, or even exceeding, 200° C. Batter, which swells up in contact with hot oil, may provide a certain protective coating but without it the survival of the comparatively heat-labile vitamin B_1 is distinctly problematical. The vitamin-B content of beer is of some interest and has recently been studied by Donovan and Hanke (1936) who demonstrated that most samples of commercial beer contain very little. From their findings it may be calculated that an adult would need to consume something over 20 pints of beer a day in order to obtain a maintenance dose!

On examination the patient was gravely ill and showed all the signs of severe congestive heart failure, with orthopnœa, distended neck veins, a tender liver palpable at the level of the umbilicus, and pitting œdema of the legs and lumbar area. The temperature was 100·2° F. The face looked slightly puffy, the tongue was furred, and there was cyanosis of the lips and extremities. Arterial pulsation was visible in the neck. The heart was rapid (120 per min.) but regular. The apex-beat was palpable in the nipple line, but the area of cardiac dullness extended for an inch beyond this. On auscultation, a triple rhythm was detected at the apex but no murmur. Blood pressure 115/65 mm. Hg. No thickening of peripheral vessels was noted and no retinal changes. A moderate number of mois

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sounds were present in the chest together with scattered rhonchi. Urine: scanty and high coloured; albumin was present together with fairly numerous hyaline casts and occasional leucocytes, but no red cells. Nervous system: no gross changes were found at this stage, but there was tenderness of the triceps and calf muscles; tendon reflexes were present.

Progress.—It was evident at the outset that this was a case of acute heart failure without obvious organic cause. After three days of complete rest with restricted fluids and an intramuscular injection of Salyrgan some improvement was noted. The temperature fell to normal on the third day, respiratory distress and cyanosis were less pronounced and the apical third sound had disappeared, but the other signs of severe congestion remained. By this time the rather remarkable dietetic history recorded above had been pieced together and the possibility of an acute heart failure of the type found in beri-beri was considered. With this in view he was given as nutritious a diet as possible, supplemented with large amounts of Marmite and Bemax. Further injections of Salyrgan were given on alternate days. At the end of a week very striking improvement had taken place. The patient was now breathing easily, there was no cyanosis and very little œdema. The blood pressure was 130/80 and the pulse-rate between 80 and 90 per minute. A rapid shrinkage of the engorged liver had occurred and at this time barely two fingers-breadth was palpable. There had been a brisk diuresis. Progress continued with a healthy return of appetite and three weeks after admission the liver edge could no longer be felt, and beyond a certain nervous excitability of the heart rate no cardiovascular abnormality could be detected by ordinary examination. Blood pressure was now 130/85 mm. Hg.

Electrocardiograms taken on Jan. 5th and Feb. 14th are set out for comparison in Fig. 1. They display the unusual and perhaps diagnostic feature of an abnormally short period of conductivity coinciding with the acute stage of failure and subsequently lengthening.

Radiography.—A reduction in the size of the heart after recovery from the congestive failure may be seen in Fig. 2.

Nervous signs.—As already noted there was little demonstrable abnormality on admission beyond tenderness of certain muscle groups. This tenderness persisted and six days later he was found to have absent knee- and ankle-jerks. Biceps jerks were present but the triceps jerks were not obtained. Slight weakness of both calf muscles was noted and also of triceps on the left side. There was defective vibration sense below the knees on both sides with indefinite areas of anæsthesia to light touch on the feet. These signs persisted long after all evidences of cardiac failure had vanished. On Feb. 2nd, a month after admission, knee- and ankle-jerks were still absent and there was still tenderness of the calves. Vitamin-B concentrates by mouth were at this point supplemented by intramuscular injections of Betaxan in doses equivalent to 4 mg. of crystalline vitamin B_1 daily. Three weeks later deep pressure tenderness had gone and sluggish knee- and ankle-jerks were obtained. All signs in the central nervous system were finally normal three months after admission.

Additional investigations.—Wassermann reaction negative. Blood count (Jan. 27th): red cells, 5,160,000; hæmoglobin, 85 per cent.; colour-index, 0·8; white cells, 18,600; differential count normal. Fractional test-meal on three occasions showed absent free hydrochloric acid throughout, even after histamine injection. Renal function: the urine continued to contain a trace of albumin with occasional casts in the deposit for three months; excretion tests, however, showed good function. Weight: reckoning from the last known weight shortly before admission and prior to the appearance of œdema there was a calculated gain of nearly 30 lb. after three months' treatment in hospital.

At the time of writing and more than a year after admission the patient remains fit and well and free from any sign of cardiac or nervous disease.

DISCUSSION

It may be of assistance to refer at this point to the orthodox clinical picture of beri-beri, the cardiovascular features of which have been well described by Keefer (1930) and Wenckebach (1928, 1932, 1934). The two principal manifestations, already mentioned, are polyneuritis and circulatory disturbance. Patients with polyneuritis may show any gradation from slight muscular weakness, painful calves, and loss of tendon reflexes to widespread motor paralysis with varying degrees of hyperæsthesia and anæsthesia. The less common but more serious cardiac cases on the other hand are characterised by congestive heart failure with fatigue, breathlessness, precordial pain, and œdema as prominent symptoms. Many of these have abnormal arterial pulsation associated with a widened pulse pressure. Pistol-shot sounds on auscultation over major arteries can sometimes be heard or will become audible after an injection of adrenaline. This unusual response to adrenaline is a characteristic feature of the beri-beri heart and forms the basis of the adrenaline test of Aalsmeer (1934). Wenckebach considers this reaction to be of considerable importance in diagnosis. His theories of the underlying rationale of this test are of some moment and demand further brief reference. It is maintained that circulatory failure in beri-beri is both central and peripheral. The heart muscle is said to be the seat of a peculiar form of water retention seriously impairing its contractility, while the peripheral arterioles are dilated and respond to adrenaline by widening still further and so permitting a dangerously rapid onflow of blood from the arterial to the venous side of the vascular circuit. This collapse of peripheral resistance is reflected clinically in the wide pulse pressure and audible arterial bruit. Centrally, the already weakened right heart is overwhelmed by a venous flood-tide with which it is quite unable to cope, so that typical signs of congestive failure result.

It is to be presumed that the constant outpouring of the patient's own adrenaline will determine the onset of cardiac failure in a severe case. Any factor normally stimulating adrenaline secretion, such as undue muscular exertion, must obviously aggravate the situation and perhaps explains the relative frequency of cardiac symptoms among manual workers and, from another standpoint, their recognised rarity in cases developing early paralysis. One corollary to be drawn from this is the great therapeutic value of complete rest.

Two other important features that remain to be mentioned are the X ray and clinical evidences of cardiac enlargement affecting particularly the right chambers, and certain changes in the electrocardiogram. A reduction in heart size in the radiograms coinciding with recovery from the acute symptoms is of almost diagnostic importance, since it is admittedly difficult to demonstrate such a reduction in ordinary forms of congestive failure. Although in many cases the electrocardiogram is normal, various abnormalities have been described and include such changes as negative T waves, notched R and T waves, low voltage P waves, and Q R S complexes, all of which may of course occur in other conditions. A well-recognised although

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apparently not very common finding in the ordinary classical beri-beri is a shortened conduction period that lengthens during recovery. Interest in this peculiar abnormality has become intensified as a result of a recent paper by Chopra, Chaudhuri, and De (1937a) reporting abnormally short P–R intervals in no less than 40 per cent. of cases of epidemic dropsy

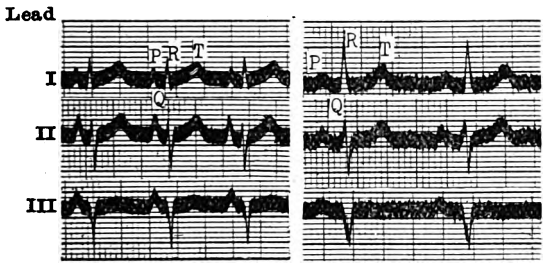

FIG. 1.—Electrocardiograms showing abnormally short period of conductivity in acute stage of failure, which gradually lengthened with treatment.

during the acute stage. These authors (1937b) have also demonstrated the very common occurrence of radiographic enlargement of the right side of the heart in this disease. It is not proposed to enter here into the ancient controversy as to the ætiological relationship between epidemic dropsy (a disease apparently confined to the Eastern provinces of India), and beri-beri in other parts of the world, but it is generally conceded that clinically there is a close relationship, and many competent observers maintain that epidemic dropsy is in fact merely a variant of beri-beri. For our purpose its importance lies in certain striking resemblances that its symptomatology bears to the case recorded above, particularly in the X ray and the electrocardiographic changes, in the rise of temperature at the onset, and in the preponderance of circulatory over nervous signs.

Although the Aalsmeer adrenaline test was unfortunately not performed in this case at a time when it might have been of value there is sufficient confirmatory evidence to establish the diagnosis of an acute beri-beri heart without it. It must of course be understood that the term "beri-beri heart" is here used in a wide sense to cover alcoholic and other forms of secondary beri-beri as well as such variants as epidemic dropsy, and without prejudice to any theory of ætiology. Reviewing all the facts it certainly seems difficult to offer any satisfactory alternative diagnosis.

PATHOGENESIS

The assumption that deficiency of vitamin B_1 is the root cause of all forms of secondary beri-beri rests on clinical analogies with the endemic disease. It must be pointed out, however, that even in endemic beri-beri there may be other important contributory factors due to the multiple defects in the diet of rice-eating populations. For instance, protein deficiency, undoubtedly present in many beri-beri diets, is a recognised cause of œdema, while as Mellanby (1934) has shown, deficiency of vitamin A is a potential cause of nerve-cell degeneration. Assuming however that defect in vitamin B_1 is the most important factor in all forms of beri-beri it still remains to be explained why the chronic alcoholic addict is so especially prone to develop such a deficiency state.

This problem may be approached from more than one aspect. As in any deficiency state the ultimate tissue shortage may be due to (*a*) defective intake, (*b*) defective assimilation, (*c*) defective storage, and (*d*) increased tissue demand from an alteration in rate or type of metabolism. These will be considered in turn :—

Defective intake.—Inadequacy of vitamin B in the diet does not occupy the same pre-eminent position in the secondary beri-beris as it does in the primary endemic form. Nevertheless it will be readily apparent that the diet of the chronic alcoholic addict invariably exhibits inadequacies both in essential foodstuffs, such as fat and protein, and in vitamin B. The well-known anorexia of chronic alcoholism may be itself the direct result of vitamin-B deficiency. Thus there is an early tendency to the establishment of a vicious circle with an ever-increasing disparity between the intake of solid food compared with alcohol, although paradoxically enough the increased consumption of the latter may bring the total calorie value of the diet up to almost normal figures.

Defective assimilation.—This is probably the most important single factor in those cases of secondary beri-beri due to abnormalities of the gastro-intestinal tract. In some of these prolonged diarrhœa or vomiting is the immediate precursor, in others a defect in the absorptive capacity of the alimentary mucosa is to be presumed. To what extent defective absorption of vitamin B is concerned in alcoholic cases is an interesting speculation. The not uncommon achlorhydria has been cited as evidence of gastric defect. Minot, Strauss, and Cobb (1933) found achlorhydria in approximately half their cases of alcoholic polyneuritis. In a more recent series Joffe and Jolliffe (1937) discovered it in 29 per cent. and in 52 per cent. of alcoholic pellagrins. The persistent absence of gastric hydrochloric acid in the case reported above has already been noted. It is well known that achlorhydria figures in a variety of deficiency states, and it is not unreasonable to presume that its occurrence in alcoholic and other secondary forms of avitaminosis B implies some degree of defective absorption of this vitamin. Direct evidence in support of this conclusion is provided by the fact that curative doses of vitamin in all these cases is very much smaller parenterally than by mouth.

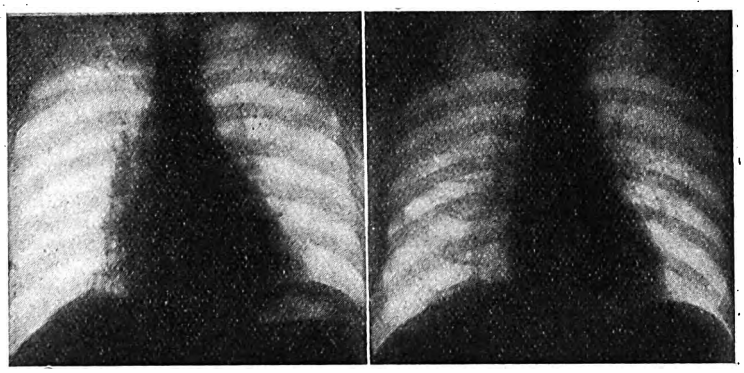

FIG. 2.—Radiograms of chest showing the decrease in the size of the heart during recovery. Note that this decrease affects particularly the right ventricle and auricle.

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Defective storage.—Comparatively little is known about vitamin-B storage. The liver has been regarded as the probable site but it appears unlikely that any considerable amount is kept in reserve. No further discussion of this aspect will be entered upon but in passing it is worth noting that, as alcohol and certain associated toxins have a selective affinity for liver cells, fuller knowledge may well bring the factor of storage interference into greater prominence.

Increased tissue demand.—Cowgill (1935) has shown that the appearance of signs of vitamin-B_1 deficiency in dogs is accelerated when the metabolism is quickened by exercise, or by the administration of thyroid principle. He maintains that the vitamin-B_1 requirement of an individual is directly proportional not only to the total metabolism but also to the total calorie intake. Cowgill's findings however need to be re-examined in the light of more recent work by Peters and his collaborators (1936), who have shown that vitamin B_1 is specifically concerned in the later stages of the metabolism of carbohydrate and allied substances. There is at present no evidence that it is concerned in the metabolism of fat or the purely nitrogenous fraction of protein. From this it seems justifiable to conclude that the requirement of vitamin B_1 is greatest when carbohydrate is the chief source of energy supplied to the tissues, and least when fat is being mainly utilised for this purpose. In other words, fat may be said to exert a sparing action on vitamin-B_1 requirement, a conclusion supported by the clinical observation that a high fat diet will delay the appearance of deficiency signs. The characteristic wasting of vitamin-B deficiency states also finds an explanation here, if it can be assumed that the body draws on its own fat reserves in an attempt to confine carbohydrate combustion to an essential minimum. The exhaustion of the fat reserves immediately accentuates vitamin-B_1 shortage and precipitates, so to speak, a deficiency crisis. The advent of an acute infection might be expected to act in the same way by causing a sudden increase in metabolic rate.

It will be seen, therefore, that Cowgill's concept needs some modification. The vitamin-B_1 requirement of an individual depends not only on the *rate* but also on the *type* of tissue metabolism, and equally therefore, not only on the total calorie intake but also on the kind of calories ingested. A diet poor in fat and protein but rich in carbohydrate engenders a type of tissue combustion calling for increased supplies of vitamin B_1. The significance of this in relation to alcohol will be at once appreciated, for alcohol can replace carbohydrate as a source of fuel almost entirely. Moreover, although on account of their relatively high calorie value they increase the demand for this vitamin, most alcoholic beverages are themselves practically devoid of it. The fault lies not in the lack but in the unbalanced distribution of calories, together with the absence of that vitamin-B_1 complement necessary for their proper combustion.

SUMMARY

(1) The case is reported of a male subject, addicted to alcoholic excess, who was admitted to hospital with a severe congestive type of heart failure together with signs of polyneuritis and who recovered completely after treatment by rest, a high calorie diet, and large amounts of vitamin B.

(2) Clinical analogies with oriental beri-beri afford ground for the belief that this syndrome is a form of "secondary" beri-beri.

(3) Attention is drawn to certain clinical features which may be of value in diagnosis. These include reversible cardiac enlargement, shortening of the electrocardiographic conduction periods, and a positive Aalsmeer test due to the morbid sensitivity of the circulation to adrenaline.

(4) The multiple factors concerned in the evolution of alcoholic beri-beri include defects in diet and assimilation acting in conjunction with increased tissue requirement of vitamin B_1 due to an increase in rate, or alteration in type, of metabolism.

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PULMONARY ATRESIA AND HYPERTROPHY OF THE BRONCHIAL ARTERIES

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Pulmonary atresia is a rare congenital deformity of the heart, but it is of interest to consider how the individual may survive for a number of years in spite of the closure of this important channel to the lungs. In a few recorded instances the interventricular septum is intact. Such cases do not long survive birth. In them the venous blood passes to the left side through a patent interauricular septum and a mixture of venous and arterial blood reaches the lungs from the aorta through a patent ductus arteriosus. We omit these from the discussion.

The tetralogy of Fallot—pulmonary stenosis, patent interventricular septum, dextroposition of the aorta, and enlargement of the right ventricle—is the not uncommon type of cyanotic congenital cardiac disease that may allow fairly long life. Keith has pointed out how failure in the development in the infundibulum of the conus arteriosus, early in fœtal life, before the interventricular septum forms, leads to this group of abnormalities. This type of pulmonary stenosis is to be contrasted with the valvular variety, in which the pulmonary valves are fibrosed and fused, perhaps as the result of fœtal

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endocarditis, at a later stage. In these hearts the pulmonary artery is often enlarged above the valves for some unknown reason. These patients are not cyanosed, necessarily, until quite late (cyanose tardive), in spite of an opening in the valves only the size, perhaps, of a lead pencil.

Some cases of pulmonary atresia seem to be extreme examples of Fallot's tetralogy. Those for discussion have, then, in addition, a patent interventricular septum, a dextroposed aorta, and some degree of right ventricular enlargement. In other recorded cases the ductus arteriosus remained open and allowed blood to reach the lungs. In all those to be discussed the ductus was closed.

CASE REPORTS

CASE 1.—A dental mechanic aged 33, who was blue since birth but was able to get about quietly and follow his occupation; he was never ill. He was of moderate build, thin, with pronounced clubbing of the fingers. His aspect was pallid, but very cyanosed, particularly in the hands, feet, and ears.

On admission to hospital he had right ventricular failure, precipitated by bronchitis, of which he died. Clinically the heart was much enlarged, to the right and to the left, with bulging of the precordium over it. The only signs on auscultation were a loud basal second sound and a vague diastolic murmur following it. There was definitely no systolic murmur or thrill.

Post mortem, the heart was globular, weighing 896 g. The right auricle was distended. The right ventricle was larger than the left, which was itself enlarged, with thick muscular walls. Between the ventricles was a hole about 2·5 cm. across, over which sat the aorta. This was 65 mm. in internal circumference, with well-formed valves—normal size at 30 is 55–79 mm. (Tabulæ biologicæ 1926). The orifices of the coronaries were normal. The infundibulum of the right ventricle was small and ended blindly at the valves, which were found to form a conical membrane projecting into the pulmonary artery. This was 20 mm. in circumference—average normal 66·5 mm. (Tabulæ biologicæ 1926)—and with its thin walls looked like a vein. The ductus arteriosus and the foramen ovale were closed. There was a large infarct occupying almost all the lower lobe of the left lung. In the roots of the lungs were large bronchial arteries. The orifice of that supplying the left lung was 10 mm. in diameter; the other, on the right side, was 15 mm.—normal 1–2·3 mm. (Vierordt 1906). They ran just below the bronchi. The pulmonary arteries were small and thin-walled: the pulmonary veins seemed to be of normal size.

Summary.—Pulmonary atresia. Dextroposition of aorta. Patent interventricular septum. Hypertrophy of bronchial arteries.

CASE 2.—A wire-worker aged 20, who had lived a fairly active life, with no restriction of exertion. As a boy he had not cared for games, but preferred long walks. On leaving school he was employed as a house-boy, and found no difficulty in scrubbing floors, washing motor-cars, and helping the gardener. His last illness started as a "cold" which lasted two weeks.

On admission to hospital he was very cyanosed, with orthopnœa. The heart was much enlarged, with a loud systolic murmur all over the precordium. The second sound was clear. There were also the results of failure of the right ventricle. The right axillary vein was thrombosed. There was acute bronchitis. The fingers were slightly clubbed.

Post mortem, there was great hypertrophy and dilatation of the heart chambers, particularly affecting the right auricle and ventricle (weight 560 g.). The foramen ovale was closed. The infundibulum of the conus arteriosus of pulmonary artery could not be identified. The pulmonary arteries were hypoplastic and adherent to the wall of the aorta (Fig. 1). The main pulmonary trunk at its origin measured 5 mm. in diameter, and here its wall measured 0·1 mm. thick—normal diameter about 20 mm., thickness of wall 1·1 mm. (Vierordt 1906); near its bifurcation the lumen became a little wider and the wall thinner. The pulmonary valves were fused and formed an imperforate cone at the base of the artery. The aorta was central over the interventricular septum; this was deficient at its upper end, leaving a hole 4 cm. across and 2·5 cm. between septum and base of aortic valve. The coronary arteries were normal. The ductus arteriosus was closed. The bronchial arteries were both very much enlarged—the orifice of the right 15 mm. in diameter, and that of the left 13 mm. in diameter (Fig. 2). The left was filled with a thrombus. There was an ante-mortem thrombus

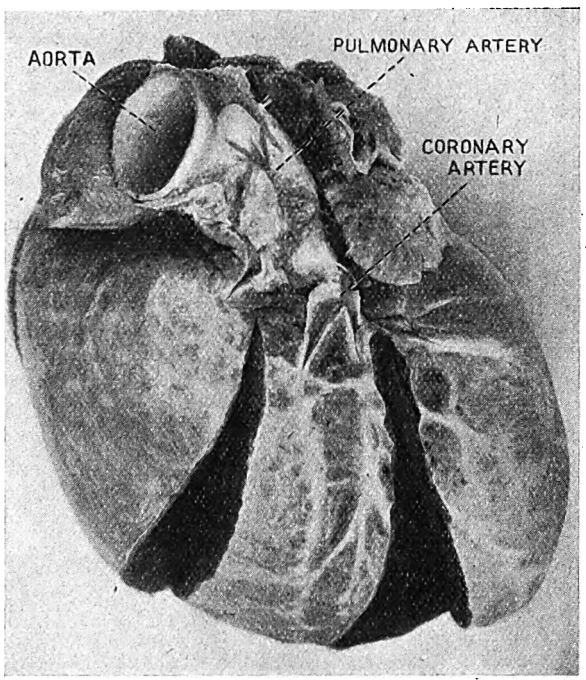

FIG. 1.—View of heart showing pulmonary artery adherent to aorta. The opened coronary artery was in every way normal.

in the right axillary vein and in the superior vena cava. There were also bilateral pleural effusions, a nutmeg liver and ascites, pulmonary tuberculosis and tuberculous enteritis. Section of the lungs showed inconspicuous pulmonary arteries, while the bronchial arteries were prominent.

Summary.—Pulmonary atresia. Dextroposition of aorta. Patent interventricular septum. Hypertrophy of bronchial arteries. Pulmonary and intestinal tuberculosis.

In addition to these two cases we will refer to the accounts of two others which have already been published—one by Bach (1928) and the other by Myers (1925). The first was seen in hospital by one of us (T. E.) several times; and also the second, when shown to the clinical section of the Royal Society of Medicine.

CASE 3 (Bach's case).—A man of 30, who was always very blue and had been liable to attacks of hæmoptysis and fainting. There was pronounced clubbing of fingers and polycythæmia.

Clinically the heart was not enlarged and there were no murmurs. The electrocardiogram showed right axis-deviation. He died of meningitis.

Post mortem, the heart weighed 12½ oz. (412 g.). There was hypertrophy of the right ventricle. A hole was present in the upper part of the interventricular

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septum, 2 cm. across. The aorta was enlarged and dextroposed, placed over top of septum. The right coronary artery only present. The infundibulum was shut off from the right ventricle, except for a very tiny hole (Keith's lower bulbar stenosis). The pulmonary artery was small and thin-walled, with three malformed valves. The ductus arteriosus was closed. The foramen ovale was slit-like. No mention is made of the state of the bronchial arteries. One cannot but wonder whether they were enlarged.

Summary.—Pulmonary atresia. Patent interventricular septum. Dextroposition of aorta. Single coronary artery.

CASE 4 (Myers's case).—A child aged 6. Cyanotic, with paroxysms of increased cyanosis. Mentality

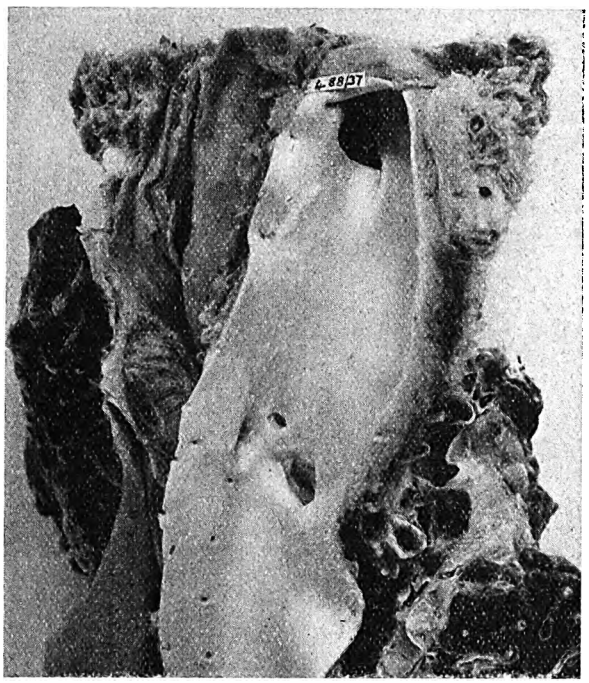

FIG. 2.—Aorta opened from behind showing mouths of greatly hypertrophied bronchial arteries and thrombosed left bronchial artery.

backward. Pronounced polycythæmia and clubbing of fingers.

Clinically there was no cardiac enlargement, and no murmurs or thrills were detectable.

Post mortem, there was hypoplasia of the infundibulum of conus arteriosus. The pulmonary valves were fused. The pulmonary artery was half the normal size, and thin-walled. The ductus arteriosus was closed. The aorta was wide and dextroposed over septum of the ventricles, in which was a large hole. Three small bronchial arteries (each about 1 mm. in diameter) carried blood to the lungs.

Summary.—Pulmonary atresia; dextroposition of aorta; patent interventricular septum.

COMMENTS

These four cases are examples of Fallot's tetralogy in which the hypoplasia of the conus of the pulmonary artery was so extreme as to amount to pulmonary atresia. In all of them the ductus arteriosus was closed. The only channels by which the blood could reach the lungs were the bronchial arteries. In two instances these vessels were greatly enlarged. In spite of their disabilities the ages at death were 33, 30, 20, and 6 years. Two of them died of intercurrent disease, so that otherwise their lives might have been longer. Thrombosis occurred in the bronchial arteries in two cases, no doubt with serious effects.

Rôle of the bronchial arteries.—How it should come about that the bronchial arteries become so large is difficult to explain. It is clear that, in the event of the ductus arteriosus closing, it is of prime importance that they should do so. The patient in whom they were small died in early childhood. It is unsatisfactory to accept a purely teleological explanation. Perhaps the low pressure in the branches of the pulmonary arteries after closure of the ductus arteriosus allows dilatation of the bronchial arteries, which anastomose with them. Perhaps there is some nervous mechanism controlling the dilatation of pulmonary and bronchial vessels which brings about enlargement. The matter is quite obscure. Little attention seems to have been paid to the possibility of the bronchial circulation supplementing the usual pulmonary one. It would be interesting to know whether enlargement of the bronchial arteries ever occurs in the valvular type of pulmonary stenosis, which probably develops later in fœtal life than the hypoplastic type. One can hardly suppose that the arteries enlarge before birth. In a case of valvular pulmonary stenosis we recently saw the bronchials were of normal size. In Case 4 (Myers) they had not become enlarged.

Diagnosis of pulmonary atresia.—Of recent years the diagnosis of congenital cardiac disease has become more accurate because its basis has been more precisely defined. This is largely due to the work of Maude Abbott (1936). The additional information provided by the electrocardiogram and the skiagram has been correlated with the clinical and pathological findings. Of the cases in the cyanotic group which survive infancy, Fallot's tetralogy is easily recognisable by its characteristic outline in the skiagram (cœur en sabot) and the systolic thrill and murmur. When the patient has survived infancy it should be possible to make the diagnosis of complete pulmonary atresia. Of course, the cyanotic lesions can rarely be distinguished in the first few months of life and many do not allow survival longer than this. If the ductus is closed the outline of the heart in complete pulmonary atresia will be as in Fallot's tetralogy. There will be cyanosis due to the venous-arterial shunt—Lundsgaard's α factor (Lundsgaard and van Slyke 1923)—though insufficient aeration in the lungs, and peripheral stasis (D factor) may also play a part in causing it. If there is a loud basal systolic murmur the case cannot be distinguished from Fallot's tetralogy. This was so in our Case 2. If there is no pulmonary systolic thrill and murmur the matter is different. Pulmonary atresia was noted in 12 instances in the analysis of 1000 cases of congenital cardiac disease by Maude Abbott (1936); of these 5 had no murmurs. When Case 1 was seen, remembering the post-mortem findings in Case 3 (Bach) and Case 4 (Myers), the possibility of complete pulmonary atresia was suggested. The clinical picture, then, seems to be recognisable. The patient is cyanosed since birth, with the usual polycythæmia and finger-clubbing, thus excluding cases of "cyanose tardive," which may develop in the valvular type of pulmonary stenosis. The heart may or may not be enlarged clinically; but it will have the "cœur en sabot" outline in so far as a concavity replaces the pulmonary bow. The aorta will be dextroposed. The electrocardiogram will show right axis-deviation. The important point is that there is no loud systolic murmur and thrill over the pulmonary artery. It must be remembered that failure of the heart tends

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to abolish murmurs, and that in any case an expected murmur may be unaccountably absent.

If the bronchial arteries are enlarged the patient may lead a fairly active life well into adult years. The part they may play in providing a collateral circulation to the lungs when the pulmonary artery and ductus arteriosus are closed needs further attention.

SUMMARY

Two cases of complete pulmonary atresia reaching adult life are described. In these patients the bronchial arteries were the only channel for the blood to the lungs, for the ductus arteriosus was closed.

Two other published cases are quoted for comparison. The possibility of the diagnosis of pulmonary atresia on the physical signs is suggested.

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DIPHTHERIA OUTBREAK ASSOCIATED WITH ICE-CREAM

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Outbreaks of illness have frequently been attributed to infected ice-cream but it is uncommon for diphtheria to be the disease reported. In the Ministry of Health (1935) records of 20 outbreaks and in one reported since (1936) other conditions have been responsible. Infections other than diphtheria were also concerned in outbreaks recorded in Glasgow in 1931, 1933, and 1936, in a county outbreak investigated by the city bacteriologist in Glasgow in 1931 and in the Aberdeen epidemic which involved some visitors from Glasgow and was reported by Kinloch (1925).

When diphtheria is food-borne the vehicle is practically always milk or a milk product. During the period 1907–36 five outbreaks of milk-borne diphtheria involving 77 cases have been recognised in Glasgow as follows: 15 cases and 20 cases in 1912, 30 cases in 1913, 5 cases in 1926, and 7 cases in 1936. Glasgow records for the same period also illustrate the fact that the frequency of diphtheria infections due to milk is less than that of scarlet fever infections. Scarlet fever infections recognised as milk-borne involved 434 persons comprised in nine outbreaks described in the annual medical and sanitary reports for Glasgow (1908, 1912, 1913, 1923, 1925, 1931, 1932).

THE OUTBREAK

In August, 1937, the first Glasgow epidemic of diphtheria attributed to ice-cream occurred in connexion with an ice-cream shop in a south-side industrial ward. It involved 13 persons, including one secondary case. A striking feature was the severity of the primary cases, 6 of whom died. The Table shows that all but one of the cases infected were children, that 9 were infected on one day, and that the majority sickened two days after consuming the ice-cream.

The opportunity for administrative action thus arose on August 20th, the removal to hospital of several cases of diphtheria from a restricted area having then been reported. Special inquiries made on that day regarding the consumption of ice-cream pointed to one of the 13 ice-cream shops in the affected ward. Complete information about recent illness in the shopkeeper's family was not provided till a later date; but the three persons found in the shop were swabbed on August 20th and one of these, the shopkeeper's daughter, was excluded from the shop as she showed a clinical abnormality in the form of nasal excoriation. Next day she was sent to a fever hospital as nose and throat swabs had been reported positive; the shopkeeper, whose throat swab was negative, was instructed to live away from home and to arrange to buy in his ice-cream; the shop assistant, whose throat had yielded a positive swab, returned

SUMMARY OF CASES

Case.	Sex.	Age.	Date of eating ice-cream from shop.	Days from eating ice-cream till sickening.	Admission.	Days from eating ice-cream till death.	Type of organism.
1	Girl.	17	August 2nd	4	August 7th	—	—
2	Boy.	6	8th (& 10th)	2	12th	6	IV
3	Girl.	4	15th	2	18th	9	IV
4	Sisters	7	15th	2	19th	—	IV
5	Sisters	5	15th	2	19th	—	IV
6	Boy.	9	15th	2	19th	—	IV
7	Girl.	12	15th		19th	10	IV
8	„	6	15th	2	19th	5	IV
9	Boy.	8	15th	2	19th	—	IV
10	„	3	14th	4	19th	21	—
11	„	5	15th	3	21st*	13	—
12	Girl.	8	15th	5	22nd	—	—

* Tracheotomy.

Case 13, a boy aged 10, who sickened on August 18th, was a direct contact and playmate of Case 7.

to her home in another town. On August 21st also the utensils were sterilised and 24 gallons of ice-cream and "mix" found in the shop were rendered unsaleable by the addition of soap powder pending removal for destruction. On August 24th the shopkeeper was excluded from the shop because a nose swab had been found positive although this throat remained negative. The business was thereafter conducted by a friend. It will be noted that although 2 further cases were admitted to hospital during the investigations they had been infected before these began.

Further details regarding the three persons present in the shop when the cases occurred are as follows:—

The shopkeeper had until July owned a sweet-shop in a small town in an eastern county where he had sold ice-cream, bought in, at the week-ends only. There had been no undue prevalence of diphtheria in that town. He opened the Glasgow shop on Sunday, August 1st. He proved to be a *virulent nasal carrier* (*Type IV*). A heavy pipe and cigarette smoker, he appeared to suffer from mild chronic pharyngitis, and on inquiry said that he had had a slight cold on or about August 17th. Early in September he was sent to a fever hospital after a throat swab had been found positive.

His daughter, aged 12, who was sent to a fever hospital on August 21st, was suspected of being a *virulent carrier* (*Type IV*) as the second of four guinea-pig inoculations gave a positive result for virulence. Her tonsils had been removed when she was aged 4, and in February, 1937, she had received one prophylactic antidiphtheria injection.

The shop assistant, aged 19, had come from a town in a Midland county on August 12th to work in the proprietor's shop and to live in his household. She

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had remained in normal health. Her throat swab was *positive* (*morphologically* only) and it was not further investigated.

The shopkeeper's home, which was situated at a different address from the shop, was first visited on August 21st. Full information about familial illness was still withheld, but three of the four persons found there were discovered to be infected. They had arrived in Glasgow on August 19th. Information regarding these four persons became available later as follows:—

Daughter, aged 2, in spite of one prophylactic injection in February, 1937, had been a diphtheria patient in a county fever hospital from June 29th until July 24th, when she had been dismissed after two negative swabs. In Glasgow in August a second and subsequent throat swabs proved positive, and in September she was sent to a fever hospital as a *convalescent carrier* on morphological grounds. Her tonsils were enlarged.

Son, aged 5, was found to be a case of *missed nasal diphtheria* (*Type IV*) and was sent to a fever hospital. His tonsils had been removed when he was aged 2, and on July 14th, 1937, he had received one prophylactic injection.

Daughter, aged 9, gave four negative throat swabs. Her tonsils had been removed when she was aged 7. She had received two prophylactic injections in February, 1937.

The shopkeeper's wife proved to be a *virulent throat carrier* (*Type IV*). Her tonsils were slightly enlarged but not inflamed and she had been liable to sore-throat since 1920.

Information was also obtained later regarding the following absentee from the home:—

Daughter, aged 16, had been admitted as a *positive diphtheria* case to a county fever hospital on August 2nd, having sickened the previous day. She had previously had her throat swabbed with negative result on July 1st as a contact of the first case of diphtheria in the household, her sister aged 2. At the beginning of August when this second case of diphtheria was detected the movements and activities of the shopkeeper had not been reported to the county authorities.

It is thus obvious that the shopkeeper and his family provided an abundant source for diphtheria infection. It was also obvious that his business exposed a considerable number of persons to infection. His shop sold 8 gallons of ice-cream daily on week-days and 12 on Sundays. Children formed a majority of the customers and usually bought a halfpenny-worth weighing 1½ oz. Adult customers usually bought a quantity weighing 4 oz. It was calculated that an average of 70 customers would partake of a gallon of the ice-cream. It was of the "custard ice" type and was manufactured by the "hot mix" method. During the early part of the week the proprietor would make "mix" and freeze it daily, but towards the end of the week he would make a large quantity of "mix" and store it for the week-end in uncovered pails on open shelves in the scullery at the rear of the shop.

EPIDEMIOLOGY

It is of epidemiological interest to record that in August 6 other cases and in September 8 cases were registered from the affected city ward. No other connexion could be established between these and the outbreak. During the previous twelve months the number of cases from this ward had averaged 2·3 monthly; and the numbers returned to this level in October and November when 2 and 3 cases respectively were notified. Three of the 6 August cases died. Two of these fatal cases had been examined for type of organism and Type IV had been reported. Only 1 of the 8 September cases died.

It is probable that few, if any, cases infected in the shop remained untraced. Inquiries regarding consumption of ice-cream were made in August and the early part of September concerning over 100 other cases of diphtheria notified during that period from an extensive south-side area of the city. No further cases connected with the outbreak were discovered. Excluding the affected ward the number of cases registered in Glasgow in August and their fatality were exceeded in other months during the year.

With regard to the bacteriological findings, Carter (1936) had found only 10 Type IV strains in 1614 positive swabs examined in Glasgow between May, 1934, and January, 1936. One learned, however, that in 1937 this type had been more often encountered in the City Laboratory and that in the autumn it was recovered from several cases besides those mentioned above.

Clinical reports from hospital stated that 11 of the primary cases showed disease of the tonsils, uvula, and soft palate, and that one of these cases had also laryngeal disease; in one case membrane was limited to the tonsils. All the primary cases were severe. The secondary case was of moderate severity.

I wish to thank the city bacteriologist for the special information readily supplied by his department.

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ABDOMINAL AORTIC ANEURYSM ASSOCIATED WITH GENERAL PARALYSIS OF THE INSANE

BY E. L. HUTTON, M.B. Lond., D.P.M.

AND

A. J. GALBRAITH, M.D. Edin., D.P.M.

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Kampmeier (1936) has recently published a paper dealing very fully with the symptomatology and findings of 73 cases suffering from abdominal aortic aneurysm, together with a comprehensive review of the relevant literature. We therefore propose to confine ourselves to the description of a case which recently came under our care.

CASE REPORT

The patient acquired syphilis in 1916 when aged 27, for which he said he had received injection treatment in Australia; the details of this treatment we have not been able to obtain.

In May, 1927, he was admitted as an in-patient to Brompton Hospital for four weeks; he complained of pain in the right side of the chest, backache for the past fifteen months, lassitude, and occasional cough with scanty expectoration. The pain was a constant dull ache with occasional sharp exacerbations unrelated to food, exertion, or breathing, and situated in the right loin. There was a family history of tuberculosis. On examination the only abnormal findings were diminished knee-jerks, obtained only on reinforcement, and in the radiogram of the chest and heart was noted scoliosis with dorsal convexity to the right, the heart lying in the concavity of the curve.

From July, 1927, to February, 1928, he attended the out-patient department of the National Hospital

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for Diseases of the Heart, still complaining of spasmodic pain in the lumbar region and also of left inframammary pain, exhaustion, night-sweats, and slight cough. Here a diagnosis was made of syphilitic cardiac enlargement, a slight increase in the size of the heart and tachycardia being the only abnormal findings noted. The patient continued to complain of discomfort in the chest and pain in the right lumbar region, and in February, 1928, he had a syncopal attack while at work.

About this time he was asked to resign from work as a boatman on the Thames, but he and his wife began making women's and children's garments and until 1934, in spite of "terrible turns of pain in his back," he continued to work a treadle sewing machine and to hawk round the goods which they made, though "his legs ached a lot and he could not walk far without wanting to lie down."

In November, 1930, he attended the Middlesex Hospital complaining of sharp shooting pain in the right side of his back, and he was then found to have signs of central nervous system involvement, Argyll Robertson pupils, and analgesia over chest, calves, and shins, but his reflexes were present. In October, 1931, he lost the use of his legs and was in bed at home for "a long time."

In April, 1932, he reattended the Middlesex Hospital and was subsequently admitted. His physical signs were as above, but, in addition, there was found severe deformity of the spine and a positive Wassermann reaction of the serum. A radiogram of the spine was interpreted as follows: Destruction of the sides and anterior parts of the bodies of the 10th, 11th, and 12th dorsal vertebræ with fairly marked angulation in this region. Joint spaces have become obliterated and antero-posterior view shows shadow to the left of the involved vertebræ which may be that of an abscess. Diagnosis: tuberculous or tabetic spine (Fig. 1). The patient was fitted with a spinal support and treated with N.A.B., mercury, and potassium iodide.

About August, 1934, he suddenly developed the typical grandiose symptoms of general paralysis of the insane, necessitating his removal to hospital and certification. The physical signs of the disease were not very pronounced, his pupils were of medium size, unequal, right larger than left, irregular, the light reflex was present in the right but absent in the left; the knee-jerks were diminished but equal, while the ankle-jerks were brisk; deep pressure pain was diminished in the calves, but his gait is said to have been normal and Romberg's sign negative, and he had a kyphosis. Speech was normal. It was noted at the time that the physical signs were those of G.P.I. rather than of tabes.

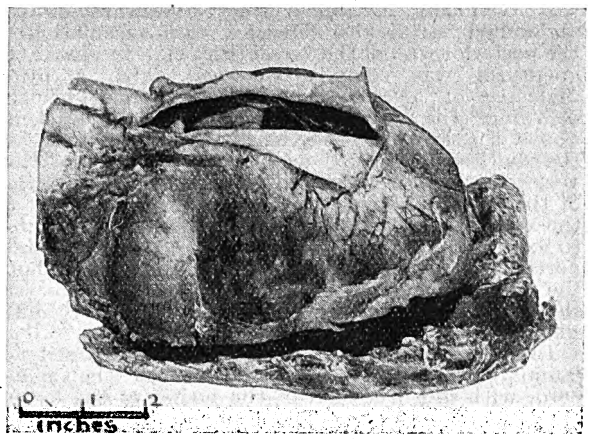

FIG. 2.—The aneurysm, opened from the anterior aspect, and part of the posterior abdominal wall.

He was given malaria therapy, having thirteen peaks of fever, followed by 22 g. of tryparsamide; he then showed considerable improvement, worked in the clerk's office, and was allowed ground parole.

In February, 1935, he began to develop definite symptoms and signs of compression paraplegia; swelling of his left ankle with sensations of "warmth" and "pins and needles," shooting pains in the ankle, and soreness round the waist. In April, 1935, he became very unsteady on his legs and had to be put to bed; his knee-jerks were very much diminished and his sense of position much impaired, but his ankle-jerks remained brisk.

The paraplegia gradually progressed, his lower limbs became completely powerless and œdematous, he had difficulty with micturition, and ultimately developed trophic sores on sacrum, hips, scrotum, ankles, and feet, and finally died on Jan. 28th, 1937. As he first began to complain of pain at the beginning of 1926, the duration of the aneurysm must be at least eleven years.

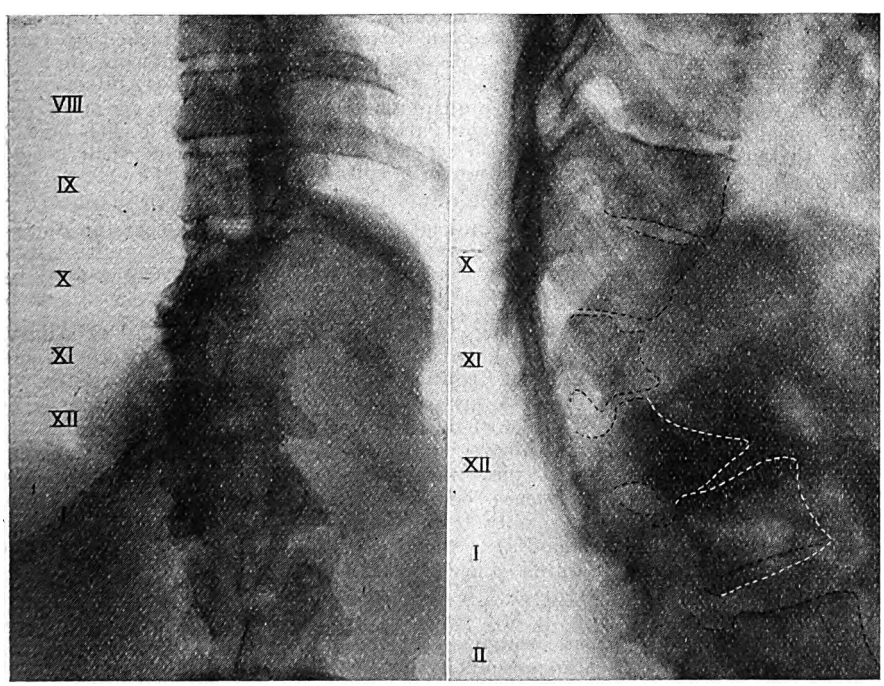

FIG. 1.—Antero-posterior and lateral radiograms showing shadow cast by aneurysm and erosion of vertebra, producing angulation.

POST-MORTEM FINDINGS

The patient was a rather undernourished man with a moderate degree of dorsal kyphosis, the curvature being greatest in the lower dorsal area, but not in any way confined to that region. Examination of the organs revealed a congested right lung and definite "red hepatisation" of the lower lobe of the left lung. The heart showed no gross changes and the abdominal organs were normal in appearance.

A large retroperitoneal tumour was observed which

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was obviously an aneurysmal dilatation of the abdominal aorta, and consisted of a sacculation of the posterior wall of the vessel (Fig. 2). In shape the aneurysm was roughly spherical, with a mean diameter of 5½ in. The lower margin of the orifice of the aneurysm was situated some 3 in. above the level of the 1st lumbar vertebra, but the sac itself extended as low as the body of that vertebra, thus displacing anteriorly the intact portion of the aorta. Above, the aneurysm was adherent to the central portion of the diaphragm and appeared to extend as far as the upper limit of the abdominal portion of the vessel. The inner surfaces of both the undilated portion of the aorta and the aneurysm showed numerous atheromatous and syphilitic plaques.

Dissection of the back revealed a large quantity of laminated blood clot penetrating into the spinal cord, with much erosion of the bodies of the lowest three dorsal vertebræ. The destruction was worst in the 11th dorsal vertebra, but there was no actual collapse of the column.

The spinal cord in the region of the vertebral erosion was embedded in blood clot, and on removal revealed an extensive destruction of the anterior portion of the lowest 3 in. of the cord itself and of the uppermost inch of the cauda equina. The damage was greatest at the centre of this area and accounted for almost half the depth of the cord. Sections of the cord taken 1½ in. above the erosion showed a complete bilateral degeneration of the posterior columns, and slight degree of peripheral degeneration in both postero-lateral areas. Selective staining demonstrated that much of this white matter degeneration was of fairly recent origin.

Histopathological examination of the brain confirmed the clinical diagnosis of G.P.I.

The two main features of interest in this patient were the long duration of the history and the association of the aneurysm with general paralysis of the insane.

We wish to thank the Brompton Hospital, the National Hospital for Diseases of the Heart, and the Middlesex Hospital for supplying us with such exact details of the patient's earlier signs and symptoms, thus making possible a complete and accurate clinical history extending over many years. We are also grateful to the Middlesex Hospital for allowing us to reproduce the radiogram.

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MEDICAL SOCIETIES

SOCIETY OF MEDICAL OFFICERS OF HEALTH

AT a meeting of the fever hospital medical service group of this society, held on March 25th, with the president, Dr. J. A. H. BRINCKER in the chair, a discussion on the spread of

Streptococcal Infection as Ascertained by Type Determination

was opened by Dr. V. D. ALLISON (Ministry of Health Pathological Laboratory), who described the classification of hæmolytic streptococci into groups by Lancefield's precipitation method, the importance of Group A in human disease, and the identification within this group by Griffith of some 26 serological types by means of specific agglutinating sera. The multiplicity of types was, he said, of real help in tracing the sources and paths of spread of infection, while group classification was of little value as it did not exonerate from suspicion those who might be harbouring Group A type other than the type responsible for the outbreak. The main value of type determination in infections caused by *Str. pyogenes* was, he said, to be found in two directions :—

(1) The investigation of the source and paths of infection in explosive outbreaks of streptococcal infection due, for example, to milk and in outbreaks of puerperal fever in maternity homes and hospitals.

(2) The investigation of the paths of spread of infection in the wards of general and fever hospitals, and the effects of reinfection and cross-infection as the cause of grave complications.

The advantages of type determination had been well exemplified in many explosive outbreaks of streptococcal infection, some of major importance, during the last few years, for example, the outbreaks caused by milk infected with *Str. pyogenes* at Denham, Chelmsford, and Doncaster, where in each case the source of infection had been definitely established. In numerous outbreaks of puerperal fever the identification of the infecting strain had given a clue leading to the discovery of the source of infection. In his own experience, said Dr. Allison, epidemiological investigations of streptococcal infections in multiple-bed scarlet fever wards and in cubicles had shown conclusively that—

(1) Patients nursed throughout their illness in cubicles or chambers show no change of the serological type of the infecting streptococcus. Segregation of patients in small wards according to the serological type of the infecting streptococcus showed that if a change of type occurred, it was due to the introduction of fresh infection by a member of the ward staff.

(2) Infection with one serological type of *Str. pyogenes* does not necessarily protect a patient against infection with another type.

(3) The so-called relapse in scarlet fever is due to fresh infection with a streptococcus picked up from another patient in the ward and differing in serological type from that causing the primary infection.

(4) In multiple-bed wards for scarlet fever 50–70 per cent. of the patients become reinfected with one or more fresh types of *Str. pyogenes* during their period of detention in hospital.

(5) Such reinfections may be latent or manifest.

(6) Complications in scarlet fever occurring during the third week and subsequently in multiple-bed wards are in the great majority of cases caused by reinfecting types of *Str. pyogenes*.

Turning to the paths of infection, Dr. Allison quoted experimental proofs of spread by direct and indirect contact, illustrating the importance of infected toys, handkerchiefs, and eating utensils as vehicles of infection. Air-borne infection by droplets was also a well-recognised means of spread, but the part played by dry dust particles, in which *Str. pyogenes* could survive for a considerable time, was only beginning to be recognised. Exposure of blood-agar plates for short periods in scarlet fever wards and examination of the resulting cultures indicated a surprisingly high degree of air infection with *Str. pyogenes* and the types isolated from the air were exactly those found as infecting agents in the patients in the ward.

In measles wards and in the wards of general hospitals the problem of the spread of streptococcal

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infection was, said Dr. Allison, equally important. In a measles ward over a period of seven weeks *Str. pyogenes* had been isolated at some time during their stay in hospital from 35 out of 43 patients and 22 of these were the result of cross-infection occurring in the ward. Out of 17 cases of otitis media in the series, 8 were due to cross-infection with types of *Str. pyogenes* from other patients in the ward. The problems raised by these findings were now being investigated and cumulative evidence showed the pressing need of dealing with them with a view to getting fewer complications, a decrease in the average period of hospitalisation, and better end-results of treatment.

Dr. R. CRUICKSHANK (L.C.C. Group Laboratory, N.W. Hospital) said he wished to draw attention specially to air-borne infection. By this he meant not "droplet" or "spray" infection which had only a very limited spread but the dissemination of bacteria by the air rather like nature's method of sowing seeds. Recent epidemiological and bacteriological findings have suggested that infection—and not only respiratory tract infection—spreads, in spite of rigid precautions against manual transference, by fomites or by carriers. The work of W. F. and M. W. Wells in America has demonstrated how this may be possible. They showed that droplets expelled into the air by coughing and sneezing need not immediately fall to the ground within a few feet of the individual. If the droplets do not exceed 0·1 mm. in size, evaporation rapidly reduces them to so small a compass that they remain suspended in the air like particles of smoke. Larger droplets or other infective material that do settle may become evaporated and be lifted into the air again as dust. The potentiality of these "droplet nuclei," as Wells calls them, for spreading infection will depend among other factors on their viability and their concentration. Wells found that certain organisms which commonly occur in the upper respiratory tract, e.g., hæmolytic streptococcus, pneumococcus, *C. diphtheriæ*, remain viable in the atmosphere for two days, whereas intestinal bacteria, e.g., *B. coli*, *typhosus*, and *dysenteriæ*, died off within eight hours.

Dr. Cruickshank went on to give examples in his own experience of air-borne spread of streptococcal infection, corroborated by the new method of serological typing.

The first of these concerned infection of burns which are particularly susceptible to the streptococcus. In a burns ward, it was found that 8 cases were infected with the same type of *Str. pyogenes*, that the dust and atmosphere of the ward contained numerous hæmolytic streptococci, and that a strain isolated from the dust was the same serological type as a culture from an infected burn. Great care was taken to prevent manual spread from case to case and throat carriers among the nursing staff were not common.

The second example was a small outbreak of puerperal sepsis where throat carriers and direct transference could be almost certainly excluded and where again the epidemic type of *Str. pyogenes* was found in the atmosphere of the ward. The abraded genital tract of the parturient woman is, like a burn, particularly susceptible to attack by the streptococcus.

Occurrence of streptococcal infections (tonsillitis, otitis media, and vaginitis) in a diphtheria ward of young children furnished the third example. In addition to the clinical infections most of the children had hæmolytic streptococci in the nose or throat (more particularly in the nose), whereas there were no carriers among the nursing staff. Hæmolytic streptococci of the two infecting types were present on plates exposed in the ward and were most numerous where the infected cases were occurring (although the plates were beyond the reach of "droplets") and after the dust of the ward had been stirred up by sweeping and dusting.

Dr. Cruickshank suggested that we should not be too ready to incriminate nursing staff for the spread of infection, that we must not depend too much on bed-isolation to prevent spread, and that wet dusting should be the routine practice in infected wards.

DISCUSSION

Dr. R. A. O'BRIEN (Wellcome Research Laboratories) thought that some of the findings might be open to criticism if they were based on the examination of a single swab from the patient on admission. The opening papers raised some interesting questions. Was the Dick-negative nurse less likely to get a streptococcal infection in a heavily infected ward? Was it necessary to nurse every patient with a hæmolytic streptococcal infection in a single room open only to the air? Should as much care and attention be given to streptococcal carriers as to typhoid carriers?

Mr. T. B. LAYTON (otologist, L.C.C. Fever Hospitals) had visions of patients with hæmolytic streptococcal infections being nursed in wards appropriate to the type of the organism. He commented on the tendency to remove otitis cases from scarlet fever wards in order that they might be isolated, and observed that it was not the otitis case who required to be isolated but the pre-otitis cases. He felt strongly against putting children with ear conditions in glass cells or cubicles as adverse psychological effects might result. The mind as well as the microbe had to be kept in view. He also discussed the rôle of the nurse in cross-infection.

Dr. F. GRUNDY (M.O.H., Luton) suggested that however desirable the practice of swabbing and typing of streptococci might be from a scientific point of view, he wondered if the information thus obtained might not be misinterpreted on occasions in a court of law if an action were brought against a local authority in consequence of cross-infection. Information obtained by swabbing might possibly operate prejudicially in a legal action. With regard to cubicle and chamber nursing it should not be lost sight of that a policy which is practicable in the case of large infectious hospitals, such as those of the L.C.C. and county boroughs, would be impracticable in the majority of small isolation hospitals. Some attempt however should be made in these to reduce the incidence of so-called relapses in scarlet fever by the avoidance of overcrowding and by grouping cases in such a way that convalescents without complication are not brought into contact with acute admissions.

Dr. A. TOPPING (sen. medical officer, L.C.C.) said he did not entirely agree with Mr. Layton about the bad psychological effect of keeping children in solitary isolation where single rooms were constructed mainly of glass. In modern single-chamber units children had little if any feeling of being shut off from their fellows and the majority of them kept remarkably cheerful. He emphasised the necessity for agreement as to the name to be applied to such separation rooms; the word "cubicle" should, he thought, only be used where walls did not extend from floor to ceiling. There was, he suggested, a tendency to attribute the occurrence of puerperal sepsis to the nurse or the midwife in the case who happened to harbour a hæmolytic streptococcus in throat or nose without excluding other more likely causes.

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Dr. E. H. R. HARRIES (L.C.C. North Eastern Hospital) endorsed the opinion of Dr. Topping that in cubicles or chambers of modern design and lay-out children did not become depressed and miserable. "Singularly cheerful" had been applied by independent medical observers to the demeanour of children in the new chamber blocks at his own hospital. As to the rôle of particles floating in the air of wards as agents in the dissemination of infection, as distinct from droplet spray, Dr. Harries drew attention to C. V. Chapin's classical "Sources and Modes of Infection" (1910). This book was in a way the bible of those, such as Dr. Claude Rundle, who had carried out the earliest experiments which led to the establishment of bed-isolation methods in this country. Chapin discounted the importance of air-borne infection and stressed that of droplet spray, the hands of attendants, and utensils. Damp-sweeping, or better the use of vacuum cleaners, was an essential part of the technique of bed-isolation. Nobody would intentionally admit patients in the early stage of chicken-pox or measles to a bed-isolation ward. The infectious conditions most safely managed in these wards without spread were those due to the hæmolytic streptococcus. Patients suffering from scarlet fever, erysipelas, and puerperal sepsis had in his own experience been nursed at the same time in the same ward under bed-isolation conditions without spread of infection to other patients. Nevertheless, other factors remaining unaltered, it was possible so to increase the load of streptococcal infections in the ward that the system broke down and cross-infection occurred. Dudley's conception of the "velocities of infection" was, he thought, important.

Dr. J. C. SLEIGH (M.O.H. Chatham, late Chelmsford) remarked that a curious feature of the Chelmsford outbreak was that of 33 cases of scarlet fever with onset in the fortnight previous to the milkman infecting the milk 28 received their milk from the infected source. They were late notifications and so were not typed but it suggested that the milk had been infected earlier, that the milkman was infected from his own milk, and that the passage through the human host had raised the virulence of the strain, leading to the explosive outbreak. With the assistance of Dr. Camps typing had been continued since the outbreak and it was found that in a comparatively small district there were seldom more than 3–4 types at any one time. Cases showing secondary rises of temperature were re-typed and always showed a different type from that obtained on admission. Lately all cases had been kept in bed till fit for discharge; this had lowered considerably the amount of cross-infection and as they were usually negative for hæmolytic streptococcus by the end of the third week it had not meant keeping them in bed too long. Typing also helped in separating out true "Return" cases. A patient had been admitted as a probable mastoid; he was type 6 but cleared up and was discharged. Within 36 hours he was readmitted almost moribund and died within 24 hours of streptococcal meningitis. It looked as if a bad mistake had been made until the streptococcus in pus from the brain was shown to be of type 1, and there were no other cases of that type in hospital at the time. Unless one could type the streptococcus found it was, he thought, unwise to swab the midwife's throat, as it would simply take off duty a large number of midwives unnecessarily.

Dr. J. MCGARRITY (City Hospital, Birmingham) advocated the value of fresh air and bed-isolation principles in ordinary wards. He deprecated overcrowding. In Birmingham there were three bed-isolation wards where all sorts of doubtful cases were isolated; in these wards cross-infection was non-existent during recent years. The technique of bed isolation was carefully observed and the windows were wide open all the time, both night and day even in the winter. The temperature of the ward did not matter; patients could be kept warm with the help of extra blankets and hot-water bottles. Stuffy overcrowded wards in his experience were bad for the patients and led to such troubles as tonsillitis and rhinitis.

Dr. E. C. BENN (City Hospital, Leeds), speaking of the immunity of Dick-negative reactors to streptococcal infections, said that a fall in the relapse-rate of scarlet fever to less than 1 per cent. followed artificial immunisation by scarlet fever toxin of those children who remain Dick positive in the second week of the disease. He mentioned the frequent occurrence of streptococcal tonsillitis in fever nurses during the first few weeks of their hospital service. As their immunity to streptococcal infection increased, either naturally from exposure to infection or as a result of artificial immunisation, the incidence of streptococcal tonsillitis fell sharply.

Dr. M. MITMAN (L.C.C. Rivers Hospitals) conceded the possibility of aerial contamination by suspended infectious particles, but thought that if it occurred, it was, in most instances, the result of droplet spray. Infection in the air or dust becomes diluted rapidly as the result of drying, the action of sunlight, and the movement of air in a well-ventilated ward. In consequence, the mass of infection is usually insufficient to initiate an attack of the disease. Direct droplet infection must still be considered the most important mode of transmission of infectious diseases. In investigating the contamination of the atmosphere with suspended particles he suggested, as a possible alternative to the elaborate air centrifuge, a blood-agar plate moving slowing in a vertical direction through the air. An adjacent stationary plate would provide evidence of infection from falling particles. In this way a comparison between floating and falling particles could be obtained. Dick-negative subjects were on the whole, he believed, more resistant to hæmolytic streptococcal infections than Dick-positive ones. In acquiring immunity to the antigens of the toxin, a person must also have had an opportunity of acquiring some immunity to the antigens of the organism itself, such as those responsible for its invasive properties. Although the Dick test was no measure of this bacterial immunity, a negative result indicated a previous acquaintance with the organism. Difference in the behaviour of the same type of streptococcus gaining access to the body through different portals of entry was attributable, he thought, to differences in local immunity.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION. — The following post-graduate courses have been arranged to take place during May: psychological medicine at the Maudsley Hospital (April 25th to May 28th); plastic surgery at various hospitals (May 11th and 12th); proctology at the Gordon Hospital (May 2nd to 6th); gynæcology at the Chelsea Hospital (May 23rd to June 3rd). Week-end courses will be as follows: cancer at the Royal Cancer Hospital (April 23rd and 24th); children's diseases at the Infants Hospital (April 30th and May 1st); chest diseases at the Brompton Hospital (May 7th and 8th); general surgery at the Princess Beatrice Hospital (May 14th and 15th); physical medicine at the St. John Clinic and Institute of Physical Medicine (May 21st and 22nd). Further information may be had from the secretary of the fellowship at 1, Wimpole-street, London, W.1.

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REVIEWS AND NOTICES OF BOOKS

Studies on the Physiology of the Middle Ear

By J. GRANDSON BYRNE, M.D. London: H. K. Lewis and Co. 1938. Pp. 298. 18s.

THE experiments here recorded were made on the living animal, mainly on cats but some on dogs, and kymographic tracings have for the first time been taken directly from the membrana tympani. The greater part of the book is occupied by a detailed description of investigations into the action and innervation of the tensor tympani, the stapedius, and the dilatator tubæ auditivæ, and each chapter contains a useful discussion of the significance of the various experiments. Dr. Byrne agrees with those physiologists who regard the ossicles and muscles of the middle ear as the accommodation apparatus of hearing, the contraction of the muscles adjusting the membrana tympani and the membrane of the fenestra ovalis for the mediation of various vibrations. The tensor tympani, which retracts the membrane, may be regarded as the analogue of the dilatator pupillæ of the eye, while the stapedius, which produces proptosis of the membrane, is the analogue of the constrictor pupillæ. During coma and sleep the membrane is proptosed and the ear is not accommodated for hearing. When, however, the individual is aroused by a stimulus of sufficient intensity, the "startle reaction" is produced and the membrana tympani becomes retracted, or accommodated for distance, as preparation for "avoidance by flight"; after a moment, however, as he becomes orientated to his surroundings, this gives place to the "reaction in approach" and the membrane becomes partly proptosed or accommodated for near, with the object of investigating the situation. The analogous reaction of the pupil is dilatation followed by constriction. Thus, as the author says, the reciprocally innervated effector mechanisms located in the tensor tympani and in the stapedius furnish a mechanism for auditory accommodation closely resembling in every respect the mechanism of visual accommodation. During sleep proptosis of the membrana tympani adapts the ear for the reception of sound waves of high pitch and intensity, but not for those of moderate intensity incidental to ordinary speech. Hence the sleeper does not hear ordinary conversation well, but, on the other hand, an abrupt stimulus finds too ready transmission through the ossicular chain and strikes the perilymph with such intensity as to cause a painful start. Dr. Byrne concludes this chapter by saying that "we live in an age of noise at the mercy of thoughtless obtrusiveness on the part of noise makers. It is possible to condition the auditory mechanisms to withstand noise in the waking state, but the set of these mechanisms at the onset of sleep is such that no amount of conditioning affords protection from the shock—itself a protective mechanism—inflicted on the tired city dweller, in the night or in the early-morning hours, by thoughtless motorists."

Even those, who may not wish to follow Dr. Byrne through his intricate physiological experiments, must agree with these conclusions. The studies which lead to them were made during a period extending over several years. They were originally intended for publication in scientific journals but, at the last moment, in order to save time, it was decided to issue them in book form; hence the many repetitions which, under the circumstances, are excusable. Dr. Byrne deserves much credit for his planning and skilful conduct of a series of elaborate experiments.

Diets and Recipes

And the Treatment of Diabetes and Obesity. By E. P. POULTON, D.M. Oxon., F.R.C.P. Lond., Physician to Guy's Hospital. London: Humphrey Milford, Oxford University Press. 1937. Pp. 121. 7s. 6d.

Dr. Poulton wrote this book because of the change that has occurred in the diet of diabetic patients. The food tables in current use in England give, for the convenience of the patient, the different amounts of various articles of foods which contain 5 g. of carbohydrate. Dr. Poulton does not think that patients can make good use of such tables when a diet containing as much as 200 g. of carbohydrate is prescribed, and he has taken 20 g. as the unit which he calls a carbohydrate ration (C.R.). Some foods contain relatively little carbohydrate and these are put into separate tables containing 10 g. of carbohydrate, or ½ C.R. Similarly the foods containing fat are arranged in portions comprising 10 g. and called a fat ration (F.R.), again with a separate table for those articles which contain less fat, prepared on the basis of 5 g. = ½ F.R. The amounts of protein in the foods which chiefly consist of carbohydrate and fat are also shown, and foods which consist mainly of protein are tabulated separately. Thus a diet of 200 g. of carbohydrate and 100 g. of fat would be prescribed as 10 C.R. and 10 F.R., together with the desired number of grammes of protein. This notation and change in the values is at first sight rather confusing, but once the principle is grasped the tables are easy to understand and should prove useful both to patients and to those charged with the responsible duty of planning their diet.

The second half of the book consists of 200 recipes of different dishes, with full details for cooking. The actual weight of the food cooked in this way for several people is given and the index gives the amount of food in ounces, which contain ½, 1, 1½, or 2 C.R. and F.R. portions, together with the amount of protein in grammes. This part of the book will be of special value to patients who feel the need of a very varied diet. A series of specimen diets is supplied. Dr. Poulton has given an informative account of the amount of food required by diabetics and of the way in which it can be calculated; the notes in chapters V and VI on the organic and inorganic constituents of food are well set out. There is also included a clear description of the methods of giving insulin, the symptoms and treatment of hypo- and hyper-glycæmia, and the management of pregnancy and other complications.

Die Insulinshockbehandlung der Schizophrenie

unter Berücksichtigung des Cardiazolkrampfes. By Dr. A. VON BRAUNMÜHL. Berlin: Julius Springer. 1938. Pp. 71. RM.7.80.

WE commented last week on the more theoretical aspects of insulin-shock treatment and in its history this vade-mecum is entirely practical in its aim, and consequently goes into minute details of organisation and procedure. The first part deals with the structure, staffing, and equipment of the insulin unit

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and with the preliminary examination of the patients, the keeping of records, writing of letters of inquiry, and similar routine matters. The second part describes the phases of the "classical" treatment according to Sakel, its originator, and the variations introduced by him, as well as others devised by the author for combating resistance to insulin, and testing and inducing sensitisation. Among the latter he sets out his interesting and probably useful "zigzag" method of getting a resistant patient to respond by intermitting or greatly reducing the doses of insulin and then battering away with big doses which are thus effectual. A brief account of how cardiazol can be worked into the insulin treatment, samples of records, and a summary defence of the insulin method against criticism conclude the manual, which leaves so little unsaid that there is even a large coloured plate of the veins of the arm, borrowed with an accompanying description from Spalteholz, to guide the physician.

Theoretical Principles of Roentgen Therapy

Edited by ERNST A. POHLE, M.D., Ph.D., F.A.C.R., Professor of Radiology; Chairman, Department of Radiology and Physical Therapy, University of Wisconsin. London: Henry Kimpton. 1938. Pp. 271. 21*s*.

THE principles that govern radiotherapy are complex, and a clear description of methods in vogue by a number of leading radiologists is welcome. Each section has been entrusted to a different authority. The first on physics is by K. W. Stenström of Minneapolis. He gives a summary of accepted opinions on atomic physics, outlines the methods of analysing the röntgen spectrum, and discusses ionisation and the methods of measuring quantity of radiation. In the second section, R. R. Newell of San Francisco writes on apparatus. He describes transformers, the regulation of tube current, and the special circuits used for X ray work. The short section on super voltage and the production of artificial radioactivity might well have been extended in view of the rapid development of practical super voltage apparatus. The editor, together with Lauriston Taylor of Washington, is responsible for the chapter on dosimetry. They define röntgen ray equivalent absorption current potentials, the half-value layer, and effective wave-length. They record the statement of "equivalent constant potential" as an approximate description of quality, because it is the effective voltage equal to a constant voltage giving the same absorption curve. Röntgen ray quantity, in their opinion, is most satisfactorily measured by ionisation in terms of röntgens (r), and standard and thimble ionisation chambers for dosage meters are described. For clinical dosimetry, the range of potentials and filter is discussed in relation to the preparation of isodose charts. Unfortunately, in spite of this reference to dose with back-scatter measured on skin, the actual dose on skin and its proportional relationship to depth dose are confused by skin doses recorded in "r" units measured in air. It is disappointing that although the well-known Holfelder technique, Dejardin's multiple converging fields, and suggestions made by other radiologists are described, the author gives no information about the methods he himself prefers. Radiobiology is allotted to Francis Carter Wood of New York City, who discusses the mode of action of radiation and its effects on various organs. His own experiments and his reference to "tumour immunity" are of special interest, but the subject as a whole is now too complex to bear compression within a single chapter.

The book closes with some considerations on protection by Lauriston Taylor, and a full list of the recommendations of the National Bureau of Standards of the United States of America.

The Single Woman and Her Emotional Problems

Second edition. By LAURA HUTTON, M.R.C.S. Eng., Physician at the Tavistock Clinic, London. London: Baillière, Tindall and Cox. 1937. Pp. 172. 5*s*.

THE psychological discontents of the unmarried woman, her struggles towards sex adjustment in heterosexual as in homosexual love, has hitherto been treated very scantily even by psychopathologists. Dr. Hutton gives the fruit of her wide experience in this volume, explaining with skill the evolution of these struggles. She not only reconstructs the life-history of a certain type of woman, but wins our sympathy for those who are not only misunderstood, but have undeservedly been condemned. The general practitioner will learn much here of a type of patient whose inner problems are a closed book to him. That a second edition of this modest little volume has been called for is not surprising, for it is a concise and valuable monograph. It is daring without being either provocative or disturbing, and it treats with sympathy and tolerance a subject which has hitherto been left to the novelist and the exploiter of the seamy side of woman's psychology.

History of Corporal Punishment

By GEO. RYLEY SCOTT, F.Z.S., F.R.A.I., F.Ph.S. Eng. London: T. Werner Laurie. 1938. Pp. 261. 10*s*.

PUBLIC interest has recently been aroused by the subject of corporal punishment, and the dramatically opposed views expressed are typical of those on any subject which arouses deep passions. In outlining the history of punishment Mr. Scott does not paint a rosy picture of human nature, and every chapter adds another stain to human character. The treatment of the subject matter is agonising, and will give pleasure only to those who are already dyed with the sadist stain. It is therefore the greater pity that Mr. Scott did not discuss more fully the moral implications of punishment which psychopathology has attempted to make clear. For although he gives many historical data of a lurid kind, he deals most inadequately with psycho-sexual problems of sadism, and still less adequately with those unconscious urges towards punishment which psycho-analysis has made some attempts to elucidate. Although he ends on a benevolent note, advocating the abolition of corporal punishment, his earlier chapters leave the impression of pessimistic resignation that man is indeed base. He gives no indication that the inflictor may be seeking a moral end as well as sadistic gratification. The plea for abolition can only be put forward on the basis of a scientific discussion on the urge to punishment as well as the urge to sadism. It must, furthermore, be driven home by the demonstration that, on balance, this type of punishment does not achieve its aim of correction, and that therefore the problem can only be made clear by a discussion of unconscious causes for punishment, and the unconscious causes of the abhorrence of corporal punishment.

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THE LANCET

LONDON: SATURDAY, APRIL 9, 1938

SCHOOL EPIDEMICS

In 1929 the Medical Research Council acting in conjunction with the Ministry of Health appointed a committee "to inquire into the prevalence and mode of spread of epidemics in residential schools, especially those believed to be spread by droplet infection, and to report upon the means by which they may be prevented or restricted." The first report of the committee, a summary account of which is given on p. 853, is a document of considerable interest and value, not to be belittled on account of the absence of any important conclusions on the control of epidemic disease. The problems of the spread of the acute infectious diseases of childhood have puzzled generations of epidemiologists; they are not likely to be solved overnight, or even in five years. The committee's initial aim has been to obtain, with the coöperation of some of the large public schools for boys and girls, a precise description of the prevalence and behaviour of the various infectious diseases. Until such data—accurate, detailed, and extensive—had been obtained they could offer (and we can only endorse their proper scientific caution) no advice on methods of control. The more limited, but difficult enough, questions they set themselves therefore included: what are the sickness rates in residential schools at the present time, in general and from specific infections? what variability do these rates exhibit in time and in differently or similarly constituted schools? what is the relative power of spread of the various infections studied? how do they affect the different age-groups of children? and what is their comparative importance in contributing to loss of school time or in promoting serious complications and loss of health? Although the collection of material is not yet complete the committee decided that sufficient data on these lines had been obtained to justify the publication of the present interim report.

Before the results of the survey are set out Dr. L. R. Lempriere tells the exhilarating story of the advance that has been made in the medical supervision provided in our residential schools. Certainly the public schools are not without their opponents to-day, but the criticisms do not include Charles Lamb's terrible strictures, of being "haunted by gloom . . . on account of the hunger we all experienced which we had not the means of allaying as we had nothing to satisfy our cravings." Even as late as the early nineteenth century the accommodation of our most famous public school is stigmatised as disgraceful, some of the juniors having to sleep upon the floor. Unlimited beer seems to have been fairly general, but even of that much was undrinkable. In the reform of such conditions this journal played a leading part, campaigning throughout the nineteenth century against the prevalent abuses and hygienic evils of the schools. Dr. Lempriere is convinced that its inquiries and reports "though not always agreeable to the victims" were of the greatest value in leading to the much needed reforms. Summarising the fragmentary historical information available the committee concludes that the material conditions of life in boarding-schools were in the past "unwholesome"—an example perhaps of the under-statement now in fashion. With but one or two exceptions they showed little sign of improvement before the third decade of the nineteenth century; from then onwards we have a series of factors making for improvement. But lack of accurate data for the past, and the fact that the improvements themselves led to the entry of delicate children who in earlier years would have been kept at home, make exact comparisons precarious if not impossible.

The present incidence of illness, analysed in some 170 tables, is based upon information collected from 21 boys' schools and 10 girls' schools over the five years 1930 to 1934. A fairly complete medical history was initially obtained for each pupil and kept up to date throughout school life in these years. A comparison of the experiences revealed by the two sexes immediately emphasises the difficulties of interpreting the results in terms of such factors as environmental conditions. For instance, the attack rates of nasopharyngeal infection were much higher on the girls than on the boys. Were the girls really more susceptible to minor respiratory infections or were they subjected to a stricter control and more frequently kept out of school than the boys for conditions of health which were effectively equivalent? As the influenza rates were broadly equal the committee is inclined to the second view. Equally the older child may remain in school with a slight respiratory attack for which a younger child would be removed. In the figures actually collected nasopharyngeal infections (including influenza) were responsible for 53 per cent. among girls and 43 per cent. among boys of all time lost. Epidemic influenza was confined to the Lent term almost entirely and many other diseases were largely concentrated in it—otitis media, pneumonia, sinusitis, and rheumatism. The Christmas term, it is interesting to note, was never a time of epidemic prevalence of the infectious diseases in either sex. Epidemics of such diseases also appear to differ considerably in their ability to "work themselves out" before the end of term. Whereas about half the outbreaks of measles might be regarded as having come to a natural conclusion, no epidemics of german measles, and only a small proportion of mumps, chicken-pox, and scarlet fever outbreaks could be said to have terminated before the holidays began—an observation which with the available evidence cannot possibly be explained in terms of the number of susceptibles at risk. It is astonishing too how large a proportion of the outbreaks of infectious disease were limited to a single case. German measles the committee finds

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the most incalculable disease of all; half its outbreaks did not spread appreciably, in other instances it showed invasive powers only equalled by influenza. With some causes of sickness remarkable sex differences are revealed. The boys suffered twice as frequently as the girls from otitis media, two and a half times as frequently from pneumonia, and eleven times as frequently from acute rheumatism. Clearly various influences may be relevant, for example a stricter control of girls and earlier isolation in the event of illness, fewer large open dormitories in girls' schools, and reduced opportunities of cross-infection.

The report, as we have hinted, raises more problems than it solves. But it at least formulates those problems clearly and no solution is possible until that has been done. The committee regards itself as having completed only the first stage of a journey which must inevitably be long. Some of the striking differences observed in the incidence of sickness between the sexes, and still more between one school and another, may be due to a conjunction of favourable or unfavourable circumstances over a relatively short period of time. If, on the other hand, further observations confirm them, then it may be hoped that administrative action may be based upon the more detailed investigations into the environmental factors which the committee hopes to make at a later date. But the correlation of sickness with specific environmental factors is never likely to be easy. Even with such semi-isolated communities as the public schools there are innumerable ways in which one differs from another. To detect the important influences, to differentiate them from the unimportant, may yet prove impossible, and the committee itself is under no illusions as to the difficulties of its task. Its first report is, however, more than enough to make the student of epidemiology look forward to the next instalment with both interest and optimism.

THE ANDROID PELVIS IN OBSTETRICS

OBSTETRICAL interest in the form of the female pelvis has grown with the advance in the clinical methods of mensuration and with the increase of radiographical facilities. BERRY HART (1916) among others in this country has studied the effects of the form of the pelvis upon the presentation of the fœtal head in labour, and W. E. CALDWELL and H. C. MOLOY (1933) in America have aroused widespread interest in the obstetrical implications of their recent radiological and anatomical studies of the pelvis. It is clear both from the earlier anatomical work and the later radiological surveys that the female pelvis, genetically, racially, and as the result of circulating hormones, may assume normally a form which departs more or less seriously from that standard female type which has been distinguished from the standard male type largely by the work of English anatomists. A. THOMPSON (1899) provided an excellent account of the special characters of the female pelvis. G. ELLIOT SMITH and F. WOOD-JONES (1907–08) added to the reliability of these observations by their examination of a large number of pelves of known sex in their Nubian Anthropological Survey. D. E. DERRY (1908–09) emphasised the importance of the posterior half of the pelvis as the region in which the female characters were likely to be most manifest. Departures from the typical female pelvis have been classified in various ways. A type not often met is one which is wide in the transverse diameter but short from before backwards, called by some the platypelloid type. Another uncommon type is one long antero-posteriorly but narrow from side to side, which owing to this and other features is called the anthropoid type. The most interesting aspect of all studies of the female pelvis concerns the occurrence in women of a type of pelvis which resembles more or less the pelvis of the male and is therefore appropriately termed "android."

W. L. STRAUS (1927) believed that all intergrades exist between the male and female pelvis, and that any insistence upon distinctive female features is likely to lead to error in judging the sex of any specimen; but his own work shows that female sex characters of great reliability do occur in the posterior half of the pelvis. It seems that in all mammals except man the fœtus travels through the posterior sacro-iliac portion of the pelvis, does not rotate, and always presents the occiput posteriorly; and there is thus good biological ground for expecting the greater manifestation of the differential sexual features to occur in the posterior half of the female pelvis. The difficulties in classifying pelves arise from the fact that the inlet may vary independently of the outlet and the posterior half independently of the anterior ischio-pubic portion. However, the problem of classification is rendered simpler if one is content to regard the posterior half of the inlet as of major importance in determining the type of the pelvis in the female. The special features of the android type, which has also been called the masculine type, the funnel type, the inverted type, among other names, are the narrow sacro-iliac notch, the straight wide sacrum with perhaps an increase in the number of sacral pieces, the greater depth, and the narrow forepart of the pelvis. The obstetrical interest in the android pelvis lies in the fact that the amount of space available depends on the inclination of the sacrum, the angle of the sciatic notch, and the length of the lower portion of the ilium. All these are likely to be unfavourable to easy delivery in the android pelvis.

Though the genetic evidence makes it clear that the initial bias towards sexual differentiation depends on the chromosomal constitution, the female having the full complement of 48 while the male has only 47 active chromosomes, yet, as the facts of sex reversal show, the further development of sexual differentiation depends on the special hormonic secretions of the gonad in each sex. Amongst the responses to the gonadic secretions are the bony and ligamentous features of the pelvis, each assuming male or female characters quite early, even in the fœtus. Clearly in the android pelvis there is some inhibition of the morphological expression of the female hormones. Since we know on embryological grounds that the

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ovary, unlike the testis, is not really a single gonad but always contains a suppressed testis, we are prepared for the emergence in various ways of the male characters in the female. The ovary being really an ovo-testis, sex reversal can only take the form of the change from the female towards the male type. We might thus reasonably expect to find with an android pelvis other signs of lesser or greater degrees of virilism; Mr. PERCY MALPAS, in a communication to the January meeting of the North of England Obstetrical and Gynæcological Society, brought forward three examples of patients with hirsuties, and a male type of distribution of body hair whose pelvis was of the android type. In two of them the obstetric history was of a persistent occipito-posterior position in the first labour with difficult extraction, in one case resulting in stillbirth. The third patient, who was still undelivered at the time of the communication, also exhibited hirsuties and a male type of hair. These observations are not only of theoretical interest but possibly of practical importance. The discovery of signs of virilism in such easily observed matters as the distribution of body hair might well suggest a more elaborate radiological survey as well as direct measurement of the pelvis, in anticipation of possible difficulties in labour.

PLACENTAL BLOOD

IN Montreal as well as in Leningrad a new source of blood for storage purposes is being exploited—the placenta. Before using placental blood for transfusion the Montreal workers [1] felt that they must justify its safety and at the same time anticipate two probable objections based on age-old teaching. One, which concerns the donor, depends on the idea that the blood should be left in the placenta after the birth of the child, since its presence expedites detachment of the placenta from the uterine wall. GOODALL and his colleagues believe they have disproved this theory; they found that the separation of the placenta lasted no longer and was no less complete than when it was empty of blood. The other objection to be met is that in taking blood from the placenta one is depriving the new-born child of part of its birthright; the good obstetrician allows a decent interval to elapse before tying the cord and separating the infant from the placental reservoir. GOODALL counters by the statement that every child at birth has a polycythæmia and that the addition of still more red cells from the placenta does not give it a helpful start in life.

Having satisfied themselves that they were not interfering with the third stage of labour, and were robbing the baby only for its own good, the investigators began to consider whether in actual fact they could collect the blood. They noticed that when the clamp on the cut cord was released the blood pressure in the cord was often high enough to project the blood as far as 3 ft., and they were thus able to devise a satisfactory technique for collecting the blood and a suitable preservative for its storage. If further experience supports these results the placenta may well become the routine source of blood for transfusions, with the paramount advantage that it provides a virtually inexhaustible supply for use either immediately or after storage. The question of blood group arises. The fœtal blood group at term is fixed, though not necessarily the same as that of the mother. The probability is that in any large institution the groups of the different samples of placental (fœtal) blood will be roughly in the same proportion as those of the recipients; that is, the supply of each group will approximate to the demand. The maternity section of a general hospital is likely to provide enough blood for the needs of the whole institution. The average amount collected from each case is 125 c.cm. which, when added to 125 c.cm. of preservative—the amount advised—will provide enough (250 c.cm.) for a small transfusion. By pooling several samples of the same group after separate cross-matching larger transfusions can be given. There are further advantages in this method. Placental blood has a high cellular content—about 7–7½ million red cells to the cubic millimetre and, moreover, has more coagulation power than adult blood. Whether or not this is, as some would affirm, nature's provision to prevent exsanguination when, as in animals, the cord is torn or bitten, the fact remains that the increase is gradually lost in the ten days following birth. When placental blood is used for transfusing hæmorrhagic patients this characteristic may be welcome. The onset of hæmolysis is said to be delayed until after the fifteenth day—a longer interval than occurs on storage of either fresh or cadaver blood. The hæmolysis is attributed to the disintegration of fragile nucleated red cells rather than the mature ones and is said to have no ill effect upon the recipient.

The number of transfusions so far performed by this method is not stated but we are told that no untoward reactions have occurred. If the number is substantial, and the immunity from reaction is confirmed by other observers, a distinct advance will have been made, for no other variety of stored blood has provided absolute safety in this regard. A. BAGDASSEROV of Moscow reports 2790 citrate transfusions of blood taken from living donors and stored for not more than 14 days with some degree of reaction in 65 per cent., and M. V. ALVEROV reports 76 transfusions with fresh stored blood used up to the tenth day with 60 per cent. of reactions, and 12 transfusions after the tenth day with 83 per cent. reactions. M. G. JEANNENEY of Bordeaux, however, has used stored blood up to the fifteenth day for 312 transfusions with only nine reactions, and at the Mayo Clinic, Rochester, 149 transfusions with stored blood used up to the twelfth day gave only 12·8 per cent. reactions. The wide variation in these figures may be explained by the varying conditions and duration of storage, the different preserving fluids used, and the extent of dilution of the blood. All these figures however, except those of JEANNENEY, represent a higher percentage of

[1] Goodall, J. R., Anderson, F. O., Altunas, G. T., and MacPhail, F. M., *Surg. Gynec. Obstet.* Feb. 1st, 1938, p. 176.

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reactions than we associate in this country with the transfusion of fresh citrated blood, and until the reactions following the use of preserved blood can be reduced to a level that is within the 5 per cent. mark, it is likely to be used only in a real emergency. Perhaps the placenta will reduce this danger to negligible proportions.

PRIVILEGE BY INTEREST OR DUTY

Lord HEWART disposed of Miss MELLOR'S case in a very few words (under the circumstances set out on p. 859). The simple fact was that the Medical Defence Union had done no more than its duty in writing to her. This meant that the letters were, in the absence of malice, privileged. The question of privilege deserves perhaps a few words of explanation. Privilege, as a defence to an action for damages for libel or slander, can be either absolute or qualified. There are times when the interests of human society demand that a man should speak out frankly without anxiety about the consequences. Absolute privilege arises where a member of Parliament makes a speech in Parliament or where judge or jury, counsel, witness, plaintiff, or defendant speak in a court of law. This privilege is called absolute because even the existence of malice does not diminish it. Even if the words are spoken in personal ill-will, in anger, and without the slightest foundation, no action can be brought upon them. Qualified privilege arises through the existence of some duty or interest. As Lord CAMPBELL put it in Harrison *v.* Bush, "a communication made bona fide upon any subject-matter in which the party communicating has an interest, or in reference to which he has a duty, is privileged if made to a person having a corresponding interest or duty." The word "duty" here is not limited to legal duties but will include moral and social duties of imperfect obligation. The answer to a confidential inquiry is an obvious instance. Apart from such cases a man has a right to protect his own interests, and if the person addressed has some duty or interest in the matter, the occasion is privileged. Malice, as already indicated, can negative qualified privilege. Malice here has the sense of some wrong feeling in the mind. Forgetfulness, honest blundering, or genuine indignation are not malice; but vindictiveness, unwarranted violence of language, or statements made recklessly with a carelessness as to whether they are true or false—these may amount to malice. If the judge rules that the occasion was absolutely privileged, it is an end of the case. If he rules that there was a qualified privilege, then and not till then does any issue about malice arise. The plaintiff, of course, must prove the existence of malice. In Miss MELLOR'S case the letters of the Medical Defence Union enjoyed qualified privilege through duty and interest and there was no evidence of malice whatever.

ANNOTATIONS

THE CAUSES OF BLINDNESS

WITH the publication of its sixth report the voluntary committee on the prevention of blindness [1] brings its work to an end, for from now on its place will be taken by a standing advisory committee appointed by the Minister of Health. In the last six years the committee, under the chairmanship of Mr. P. M. Evans, LL.D., has issued five reports: on certification and examination of blind persons in 1932; on hereditary blindness in 1933; on the prevention of blindness in 1936; on cataract last year; and the present report, which is supplementary to that of 1936. The committee points out that in 1921 the total number of registered blind persons in England and Wales was 34,894, and that in 1936 this figure had risen to 67,521. It must be remembered, however, that, owing to increased benefits available to the registered blind, and to the improved methods of ascertainment and registration, a considerably larger proportion of the blind are now registered, and there is no real evidence of an actual increase in blindness. Since the publication of its 1936 report the committee has analysed over 6000 cases of blindness out of a total of about 20,000 for whom forms were forwarded for examination. As a proportion of cases could only be dealt with as single eyes and not as persons—for example, cases in which the cause of blindness was different in the two eyes—and for other reasons, the present report only comments on 5290 of these, and compares them with 2748 cases at the Glasgow clinic, which covers Glasgow and the south-west of Scotland, and 1000 cases at Birmingham. Two-thirds of the committee's series were over fifty at the time of examination. Cataract is shown to be the most prevalent cause of blindness (25 per cent.), and more than two-thirds of the 1300 cases considered are classed as operable. Glaucoma accounts for 11 per cent. and congenital, hereditary, and developmental defects for another 11. Of the latter a third are actually hereditary, and the examination of the pedigrees of a number of these which are in the possession of the committee might be of considerable value. Myopia is responsible for 10 per cent., of which 1·1 per cent. have detachment of the retina and 8·8 per cent. other fundus lesions. This very high proportion of fundus lesions suggests to the committee that some cases may have been included in which some other condition causing blindness happened to coexist with a myopic refraction. Local infection of the coats of the eye come next with 6 per cent., and then congenital syphilis with 5 per cent. In discussing the incidence of syphilis in relation to the Glasgow figures Mr. John Marshall states that it probably enters into the cause of blindness to a greater extent than the figures suggest, as the routine use of the Kahn test in 1500 cases of blindness which were diagnosed as due to other causes showed a positive reaction in 5·9 per cent. Acquired syphilis (2·83 per cent.) has an incidence comparable to that found in the clinic of an average out-patient department. Nearly 5 per cent. were due to ophthalmia neonatorum, but less than a fifth of these were born since the present public health regulations dealing with this disease came into force in 1914. Industrial trauma and disease accounted for 1·4 per cent. and non-industrial trauma for another 2·4 per cent. In some cases of industrial trauma the use of goggles or other protective measures would have prevented the acci-

[1] Report on an analysis of a preliminary classification of the Causes of Blindness, by the Prevention of Blindness Committee of the Union of Counties Associations for the Blind. Communications about this committee and its work should now be addressed to the Secretary, Ministry of Health, London, S.W.1.

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dent, but some involved the head and occasionally the whole body, and the majority of non-industrial accidents were considered unavoidable. Over 6 per cent. of the cases were due to causes which lie outside the domain of the ophthalmologist from the point of view of treatment—vascular, renal, and cerebral diseases and diabetes in particular—and in this connexion the committee draws attention to a passage from its 1936 report: "After the early years blindness, apart from accidents, is often due to general disease, and the prevention of blindness to this extent becomes part of preventive medicine. For this reason alone it is highly desirable that persons with defects of sight should seek expert medical advice with a view to finding out whether the cause of such defects is some disorder of general health."

SOYA-BEAN MILK AT SHANGHAI

OF the 350,000 destitute Chinese in camps and elsewhere in Shanghai it is the children who take most harm from food deficiencies. According to a report received from the International Red Cross at Shanghai through the Lord Mayor's Fund for China, all the refugees suffer more or less from beri-beri, and an attempt is being made to prevent this by supplying them with soya-bean milk and cakes, which contain vitamin B_1. This milk is produced at one of the hospitals: the beans are soaked and then crushed in a mill run by a small motor, which could grind enough beans to give 15,000 lb. of milk in twelve hours; but at present only 6000–7000 lb. is made, for this is the limit of cooking facilities. The bean mash is mixed with water and slowly boiled, and the hot solution is delivered to the camps, where sugar and calcium lactate are added. One pound is allowed to one child each day and delivery is twice daily. There are, it is stated, about 15,000 children under six years of age in the International Settlement and French Concession to whom the bean milk is a necessity, but enough is available for only about 7000. The bean residue after milk production is mixed with its own weight of whole-wheat flour and baked into cakes by a firm in Shanghai at cost price. These cakes are distributed to 3200 children between the ages of six and twelve, who receive two each day. The total cost of this project is about 11,000 dollars, but would of course be far greater if the milk and cakes were made on a sufficient scale. The best that most of the Shanghai camps can do for their refugees is two meals a day of hot rice and a little vegetable, chiefly dried and salted turnip. Even to keep them supplied with this meagre diet will become desperately difficult during the next two months. Unless fresh funds can be raised the camps will be faced with something approaching mass starvation.

THE PHYSIOLOGICALLY CORRECT WAY TO WRITE

A STUDY of its history has convinced Dr. H. Callewaert[1] that handwriting through the ages has rightly tended to become cursive. Gothic handwriting was at least æsthetically justifiable, but the so-called "simple script," in which the letters composing a word are not linked together, is to be commended neither from the point of view of convenience nor of physiology. An antebrachial action, with the point of the elbow used as the pivot of rotation is, in Dr. Callewaert's view, the physiologically correct way to write, permitting of a large and practical range of movement of the forearm and hand working together, and of free movements of all the fingers. A carpo-radial action, though much less ample in scope, permits of relatively rapid writing in certain circumstances, but a carpo-cubital action, often found in combination with a carpo-radial, should be avoided. The digito-radial action is fluent enough at the end of the line, but is restricted in scope even when there is a good functional dissociation between the two parts of the hand as in a mixed digito-radial movement. Similarly in the auriculo-radial action there is limitation of range of movement because the action of the little finger is divorced from that of the other fingers. Any pronouncement by a medical man, of whatever country, on the subject of handwriting is likely enough to revive the age-old pleasantry on the illegibility of prescriptions, with the suggestion that of all people the doctor is least qualified to speak with authority on this subject. It is certain that though nearly all handwriting tends to become less formal and precise with the years, those who learnt in their youth to pen each letter separately remain on the whole more easy to read in later life. Perhaps the restrictions in the scope of arm and hand movements, deplored by Dr. Callewaert, play a part in the retention of relative legibility by those who started their writing in "simple script."

[1] Physiologie de l'écriture cursive. By Dr. H. Callewaert. Paris: Desclée, de Brouwer et Cie. 1937. Pp. 122.

FERTILITY OF THE EARTH

IN a mechanised age it may be difficult for townspeople to remember that all the food of the human race is obtained by the tilling of the earth or the harvesting of the sea. Improved transport and means of food preservation have combined to reduce the effects of crop failures, at least on those nations with sufficient means to buy abroad, so that, except in time of war, the townsman is inclined to look no farther than the butcher, the grocer, and the seller of what the late H. E. Armstrong called "cleaned up milk" for the supply of his daily food. It was therefore a wise move on the part of the Royal Institution to arrange for the delivery in the heart of London of a course of lectures on the fertility of the earth. Sir Frederick Keeble, whose eloquence completed the series, expressed some alarm at the deterioration of physique and fertility in the human race and at the decreasing fertility of the soil. He welcomed the development of grass farming at the expense of arable, but argued for the better cultivation and utilisation of grass, deploring the widespread use of concentrated cattle foods and the time-honoured method of preserving grass as hay. The specimen of artificially dried grass shown on the lecture table was as green as alpine hay, but it was difficult to assent to the view that lowland hay, when well made and stored, must lose so large a proportion of salts and protein as he suggested. A strong point, amply illustrated by numerical data, was the advantage of increasing the yield of grass by the proper use of fertilisers all through the year, enabling stock to spend more of their time grazing, and to graze on newly grown grass in which nutritious and growth-promoting constituents had not given place to fibrous matters of use mainly as "roughage." Most foodstuffs derived from land plants are, according to the lecturer, deficient in iodine and iron, whence arise lack of vitality and anæmia. His main thesis, however, was the desirability of fuller recognition of the dictum that "all flesh is grass" and of greater attention to the improvement of pasturage. Much more could be done in maintaining soil in fertile condition by better cultivation, keeping up its content of humus, and supplementing its available constituents by the judicious use of manures, including

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lime in which so many soils are deficient. Another way of meeting the deficiency has recently been developed on a large scale in California, where soil has been discarded for growing plants, the requisite anchorage being obtained by sowing seeds on a mat of vegetable debris supported on wire netting over shallow trays containing dilute solutions of mineral salts, with ammonium salts or nitrates. By this arrangement the normal temperature difference of root top and leaves, with its rhythmic variation between day and night, can be maintained and the roots are free to grow in a solution in which the concentration of salts can be maintained constant or allowed to vary as desired. Enormous crops of such varied products as tobacco, lettuce, spinach, potatoes, and tomatoes can be obtained in this way and so far disease has not given trouble. This production by "hydroponics" is based on work done at the University of California.[1] Economic considerations may restrict the development of methods of this kind, except perhaps for luxury products. Meanwhile it is much to be desired that the productivity of the soil of "this blessed plot, this other Eden" should be so increased (as it could be) that, in times of peace as well as under stress of war, our basic industry may not only flourish but furnish us with most of our food, allowing other lands to send us those products which we appreciate but cannot grow.

MEDICINE IN COLONIAL PHILADELPHIA

Elizabeth Sandwith Drinker, the second wife of a prosperous Quaker merchant in colonial Philadelphia, kept a diary from 1758 until shortly before her death in 1807. Within this volume[2] her great-great-grandson has included and annotated such excerpts from this diary as are primarily of medical interest. Here is to be found a vivid account of appalling sanitary conditions, constantly recurring epidemic disease, and incompetent midwifery which should make salutary reading for those who yearn for the good old days. The Drinkers were in a financial position to command the professional services of the best doctors of the time, among whom were Rush (and his arch-enemy Kuhn), Shippen, Bond, and Physick. Nevertheless, only five of their nine children reached maturity and, despite the attentions of the younger Shippen, who had worked under McKenzie and the Hunters and was regarded as the best obstetrician in the colonies, Elizabeth herself was reduced to a state of permanent semi-invalidism as a result of her numerous and stormy confinements. She accepted her fate philosophically and devoted her energies to the care of her family and dependants, becoming an amateur doctor of great good sense. Small-pox, bacillary dysentery, typhoid, malaria, and yellow fever all flourished either sporadically or epidemically within the colony during the period of the diary, and were faithfully recorded therein by this good wife and mother, who was obviously a person of character with plenty of ideas of her own. Thus when a child swallows a pin, she is not afraid to treat it by giving raw eggs, observing that "it is admirable that so few bad consequences follow—it slips down the common sewer, with other things, and kind Nature often eludes calamity." But when two of her children, William aged 38, and Nancy 41, go out in search of ice-cream, she is not amused. "The eating iced cream, or going to the ice'd cream house are two acts neither of which I admire or approve." Yet she was "modern" enough to approve of baths and when a shower-bath was installed in her own back-yard she gallantly went into it and bore it better than she expected, "not having been wett all over at once, for 28 years past." This is a book brimful of "atmosphere" which presents a lively picture of the times.

PSYCHIATRIC CLINICS IN GENERAL HOSPITALS

In spite of increasing recognition that physical and mental diseases are interrelated and that their treatment is inseparable, the psychiatric departments which have arisen in general hospitals have mostly been confined to out-patients, and at the present moment there are not more than a dozen beds for mental patients in the London teaching hospitals, and these are mainly intended for the observation of mild borderline cases. Most of the objections can be overcome by the institution of special psychiatric wards or in-patient clinics and no doubt this is the way that development will ultimately take place. In 1931, according to the records of the International Hospital Association,[1] there were 7 such clinics in Germany and 2 in Denmark, and there are now 78 in the United States and 4 in Canada. In England one of 42 beds for patients of moderate means is to be erected at Guy's Hospital as an addition to the six beds at present provided in the general wards, and St. George's Hospital hopes to include a psychiatric clinic with 50 beds in its rebuilding scheme. The Middlesex Hospital already has 6 beds allocated to psychiatry. The advantages of these clinics are numerous. Patients can be admitted to them without the stigma of having been sent to an asylum, and for this reason they and their relatives will agree to early admission more readily. In a general hospital they will have the benefit of full equipment for physical diagnosis and the services of specialists in other branches of medicine and surgery. The staff of the hospital may well gain in breadth of outlook by closer contact with psychiatrists and may find that a period of observation in the clinic will often take the place of an exploratory laparotomy, a focal infection operation, or other forlorn hopes. It is to students, however, that such a clinic within their medical school offers most. The present system of occasional demonstrations at a distant mental hospital gives little encouragement to even those few students who feel naturally attracted to psychiatry, and leaves the average student (as we have before remarked[2]) with an impression comparable to that obtained from a series of visits to the Zoo. Dr. Harvey Agnew, secretary of the department of hospital service of the Canadian Medical Association, suggests[3] that psychiatric clinics should be designed to admit patients for periods up to three months, and that admission to them should be as informal as possible. He favours special wards rather than an isolated building to allow easy transfer to and from the general wards. About four-fifths of the accommodation should be in single rooms and the remainder in wards of not more than four beds. The rooms should be built on the vacuum flask principle so as to be almost soundproof, and the windows should have small panes of unbreakable glass and steel frames with a small opening, thus doing away with the need for bars. There should be sitting-rooms for male and female patients and a small hydrotherapy department. The neuropsychiatrist in charge of the clinic should be a member of the hospital staff and he

[1] See Gericke, W. F., *Nature, Lond.* March 26th, 1938, p. 536.

[2] Not So Long Ago. By Cecil K. Drinker, M.D., Sc.D., Professor of Physiology and Dean of the School of Public Health, Harvard University. London: Humphrey Milford, Oxford University Press. 1937. Pp. 183. 15*s*.

[1] Alter, W., *Nosokomeion*, 1931, **2**, 409.

[2] *Lancet*, 1937, **1**, 875.

[3] *Nosokomeion*, January, 1938, p. 13.

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should be assisted by a psychologist and one or more medical officers, a qualified hydrotherapist, and an ample supply of specially trained nurses and orderlies. His report carried weight when it was presented last year at an international congress in Paris.

NARCOSIS IN OPHTHALMIC SURGERY

Basil Graves has recently drawn attention [1] to the state of shock induced in some elderly persons who have to face an ophthalmic operation performed under local anæsthesia. This shock has been blamed for subsequent restlessness, delirium, flatulence, abdominal discomfort, and even death, and its avoidance is often attempted by inducing a "surgical narcosis" which ranges from a placid mental acquiescence to full unconsciousness. Such drugs as morphia, Omnopon, scopolamine, paraldehyde, Avertin, Nembutal, sodium Evipan, and sodium Pentothal have been used for this purpose. Unfortunately, however, many of these may endanger the success of an ophthalmic operation both during its performance and afterwards. The opium derivatives are liable to cause vomiting and abdominal discomfort in patients who have an idiosyncrasy to these drugs. Paraldehyde has been known to produce a state of muzziness and restlessness for a couple of days after operation. Avertin often has to be supplemented by inhalation anæsthesia, and its use has been followed by retching, nausea, vomiting, and restlessness. Nembutal is valuable in some cases, for it may produce a placid tranquil state without loss of coöperation; but its effect is variable, and a dose without apparent effect on some persons may in others give rise to a restlessness that makes it impossible to perform an operation on the eye. Sodium evipan administered intravenously must be supplemented by local anæsthesia, and its injection is sometimes followed by sneezing, head-raising, and jactitations, which would be disastrous in intra-ocular surgery. The latest preparation in this field, sodium pentothal, seems to have none of the disadvantages of sodium evipan, for the induction, anæsthesia, and recovery to consciousness are smooth and uneventful. So far as present experience goes, it appears to be a satisfactory anæsthetic for patients who are unlikely to coöperate properly, or whose eyes are congested and painful.

SECRETIN

OFTEN a long time elapses between the discovery of a physiological fact and its application to clinical medicine. The delay commonly arises from failure of the laboratory worker or the clinician (or both) to appreciate the usefulness of the new information. This is not the reason, however, for the interval between the discovery of secretin by Bayliss and Starling, in 1902, and the first successful attempts to make clinical use of it, in 1936. The possibilities of the hormone, in diagnosis, therapeutics, and human physiology, have been more or less clearly recognised for many years, but the preparations hitherto available have not been pure enough to permit their routine use in the human subject. A few studies have been made, it is true, but all have been hampered and restricted by unwanted side-reactions, of varying severity, caused by toxic substances contaminating the preparations. Unfortunately secretin is ineffective if given by mouth or subcutaneously; it must be injected intravenously. The difficulty has now been overcome, however, by the work of Agren and Lagerlöf,[1] who have produced both pure crystalline secretin and an amorphous non-toxic preparation which is commercially available.[2] The amorphous substance is not so active as crystalline secretin, but it is sufficiently powerful to be of great service in the investigation, and possibly treatment, of pancreatic and hepatic disturbances in man. Agren and Lagerlöf have already studied the pharmacological activity of their preparation and utilised it to devise tests for pancreatic and biliary function. Their results indicate that the response of the pancreas to a standard injection of secretin is constant within surprisingly narrow limits; that secretin has relatively little stimulant action on the formation of pancreatic enzymes, but causes the secretion of the alkaline fluid vehicle (a result in agreement with animal experiments); and that under certain conditions pancreatic diastase may be diminished whilst the trypsinogen content of the pancreatic juice is unaltered. These results await confirmation. Now that a pure enough preparation of secretin is available there should be a rapid advance in the clinical study of pancreatic function, not overlooking the possible therapeutic applications.

"ALCOHOLIC" BERI-BERI

ELSEWHERE in this issue Dr. Price describes a remarkable case of heart failure with polyneuritis in which recovery followed administration of vitamin B_1. Alcoholism and a deficient diet were outstanding features and from his studies of the state of the heart and nervous system Price feels justified in naming the disease beri-beri. In recent years the curative effect of vitamin B_1 in alcoholic neuritis has been repeatedly reported. American workers have played a leading part in this work, and Goodhart and Jolliffe [3] from their experience emphasise the importance of giving large quantities of the vitamin by injection. They find that a daily intravenous injection of 10 mg. of crystalline vitamin B_1 greatly hastens the rate of recovery. Unfortunately, as they point out, there has hitherto been no convenient chemical procedure for estimating the degree of vitamin-B_1 saturation in the body, and without such a test the exact value of the therapy can only be estimated roughly by observing the effect of treatment. Dr. L. J. Harris,[4] however, gives us reason to hope that such a test will soon be established. Vitamin-B_1 deficiency is probably commoner in this country than is generally realised, though the major clinical manifestations seem to be rare. Certain cardiac disorders and conditions in which there is loss of appetite are probably associated with this deficiency and there is reason to advise intensive administration of the vitamin in all forms of polyneuritis except perhaps acute infective polyneuritis which seems to be unaffected by it. Some also hold that the nervous complications of pernicious anæmia should be treated with injections of vitamin B_1 as well as with liver extracts,[5] and this view is supported by recent reports from Germany. Zettel,[6] for example, has had good results from injection in cases of subacute combined degeneration of the spinal cord which had failed to respond to adequate liver treatment

[1] *Brit. med. J.* 1937, 2, 319.

[1] Agren, G., and Lagerlöf, H., *Acta med. scand.* 1936, 90, 1 and 224; 1937, 92, 359. Hammarsten, E., Agren, G., and Lagerlöf, H., *Ibid*, 1937, 92, 256.
[2] Sold under the name of Pancreotest by Aktiebolaget Astra, of Södertälje, Sweden.
[3] Goodhart, R., and Jolliffe, N., *J. Amer. med. Ass.* Feb. 5th, 1938, p. 414.
[4] Harris, L. J., Leong, P. C., and Ungley, C. C., *Lancet*, March 5th, 1938, p. 539.
[5] Russell, W. R., *Edinb. med. J.* 1936, 43, 315.
[6] Zettel, H., *Münch. med. Wschr.* Feb. 18th, 1938, p. 254.

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and in one case where large doses of vitamin B_1 by the mouth had had little effect.

Cowgill,[7] in summarising present knowledge of the physiology of vitamin B_1, points out that the organism's ability to store this vitamin is limited; in the pigeon and in the dog, the time taken for a shortage to become evident is about ten days and four weeks respectively. There is no conclusive evidence that lack of vitamin B_1 produces any specific dysfunction of the alimentary canal, but anorexia is a striking symptom of deficiency produced experimentally. The vitamin has likewise no specific action on the normal heart, but the beri-beri heart often returns to its normal size in a remarkably short time under its influence. Referring to the rôle of vitamin B_1 in metabolism, Cowgill says that the administration of thyroid extract increases the amount of the vitamin required, and that it is easier experimentally to produce symptoms of B_1-deficiency when a high-carbohydrate diet is given, while a high-fat diet lessens the need for the vitamin. The relation of vitamin B_1 to carbohydrate metabolism indicates that its action is generalised and not confined to certain organs or cells.

We take this opportunity of referring our readers to a valuable group of papers on beri-beri contributed at a meeting of the Royal Society of Tropical Medicine and Hygiene by Prof. R. Brunel Hawes, Prof. R. A. Peters, F.R.S., and Dr. B. S. Platt. These papers, with the subsequent discussion, are published in the March issue of the *Transactions* of the society.

CEREBRAL DAMAGE AFTER NITROUS OXIDE ANÆSTHESIA

NOT long ago we threw doubt on the assumption that nitrous oxide was to blame for certain cerebral lesions found in the brains of persons who had died some time after inhalation of this gas.[8] Our doubts were based on the fact that in every instance there had been prolonged failure of respiration during the operation. We have never seen evidence of such lesions after inhalations of nitrous oxide that were unaccompanied by respiratory trouble or some other complication for which the gas was not responsible. The observations of Courville [9] provide strong support for our opinion, for he definitely assigns to asphyxia the histological lesions that had been attributed to nitrous oxide. He begins by discussing the narcotic action of nitrous oxide and shows that the gas inevitably causes a certain amount of anoxic anoxæmia—i.e., anoxæmia arising from lowering of oxygen tension in the blood, as contrasted with other forms of anoxæmia due to deficient hæmoglobin or to slowing of the circulation. He points out that absence of cyanosis does not necessarily mean absence of anoxæmia. Finally he discusses and illustrates the histological lesions (vacuolation, enlarged pericellular spaces, isolated areas of necrosis, and subtotal destruction of cortex) that have been found in the brains of persons dying some time after an inhalation of nitrous oxide attended by unusual symptoms or respiratory failure. His conclusion is that the cerebral damage is a direct consequence of asphyxia, even though the respiratory stoppage may have been due to the depressant (narcotic) action of the gas on vital centres. Where there has not been cardio-respiratory failure cerebral damage is "probably the result of prolonged accumulative anoxemia of a dangerous degree, due to inherent predisposing factors in the patient (alcoholism), to defects in apparatus, to impurities in the gas or perhaps at times to improper administration of the anesthetic."

[7] Cowgill, G. R., *J. Amer. med. Ass.* March 12th, 1938, p. 805. Special articles on the chemistry of vitamin B_1 and on the pathology of beri-beri have lately appeared in the same journal (March 5th and 19th).

[8] *Lancet*, 1937, 2, 1325.

[9] Courville, C. B., *Ann. Surg.* March, 1938, p. 371.

THIS CONTRACEPTIVE BUSINESS

THE manufacture and sale of contraceptives in this country and elsewhere have developed into an extensive industry. In the United States for instance it is stated on good authority [1] that the profits of the manufacturers alone amount to $75 million a year, while condoms which can be made for 1½ cents apiece are sold by druggists at 1800 per cent. profit. One English firm is said to turn out 8,500,000 appliances a year, and home production is reinforced by large imports from abroad. Neither manufacture nor sale is subject to any legal control. Standards for both chemical and mechanical products have been drawn up by the National Birth Control Association and the Birth Control Investigation Committee, and their value is being gradually recognised by manufacturers, medical men, and public, and in the United States it has been ruled that since such articles are sold for the prevention of venereal diseases their standards of quality are subject to the same scrutiny as those of drugs. Women in the United States are said to spend $200 million a year on mechanical devices, jellies, powders, and liquids sold "for feminine hygiene" and advertised as being "sure, safe and dependable." Many women are led to believe that this dependability refers to contraceptive properties when in fact there is not one product which is invariably safe when used alone.

Retail conditions are even more unsatisfactory. The underhand atmosphere which surrounds the sale of contraceptives has put it largely into the hands of the less reputable traders. An increasing number of shops show contraceptives in their windows with flamboyant illustrations and descriptions; such methods as street trading, sale in slot-machines, and the circularising of engaged couples are increasingly resorted to. Four years ago Lord Dawson sponsored a Bill in the House of Lords which made it an offence to offer contraceptives for sale in a public place or in an automatic machine; to go to a person's home to sell contraceptives without his request; to display contraceptives or pictures or descriptions of them in shop windows; or to circularise unmarried people under 18 years with contraceptive information. A Bill in very similar terms has now been introduced in the Commons by Mr. R. J. Russell (see p. 866), and this seeks also to prohibit the sale of appliances to persons under 18 years. This prohibition was avoided by Lord Dawson on the ground that attempts to dragoon youth defeat their own object. Unless the attention of the healthy youth is forcibly drawn to such things and their sale is pushed upon him it is probable that with few exceptions he would not obtain them.

Summer Time will commence in Great Britain, Ireland, the Channel Islands, and the Isle of Man on Sunday morning next, April 10th, at 2 A.M., when the hands of timepieces should be advanced one hour. It will end on Sunday, Oct. 2nd. Summer time in France began a fortnight earlier.

[1] According to *Fortune* for February, 1938, quoted by *J. Amer. med. Ass.* 1938, 110, 513.

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SPECIAL ARTICLES

EPIDEMICS IN SCHOOLS

SEVEN years ago the Medical Research Council appointed a committee to investigate epidemic and other illness in schools from both scientific and practical standpoints. The first report of this School Epidemics Committee,[1] which has just been issued, deals in great detail with the sickness recorded during a period of five years, 1930–34, in 21 boys' and 10 girls' schools. These schools were predominantly public and boarding-schools attended mainly by children of the "middle" or "upper-middle" social classes. The total number of children in the inquiry was 22,166 boys and 7600 girls, varying in their individual period of observation from 1 to 15 terms and in their age from 10 to 19 years. For each of these pupils particulars were obtained from the schools of all absences due to illness for one day or more, in addition to some information on the past medical history. The results have been analysed in terms of causes of sickness, seasonal incidence, sex and age differences, secular trends, and many other factors.

SEX DIFFERENCES

One of the most striking sex differences is in the recorded incidence of nasopharyngeal infection. The average number of boys attacked during a term by such causes (including influenza) was 17·4 per cent. of the total population, of girls 38·9 per cent., or more than twice as many. It is from the diagnosis "cold" that most of this difference arises, with attack rates of 22·6 per cent. on the girls and 5·6 per cent. on the boys. It is clearly not unlikely that the excessive incidence of the girls may be the result of a stricter surveillance and readier removal from school rather than of a real sex difference in susceptibility. The same difficulty arises in interpreting the declining attack rates from nasopharyngeal infections as age advances. That may be a process of natural immunisation or only the result of a younger child being kept out of school on account of a cold more frequently than an older child with a similar attack. A more secure basis is reached with serious infections such as otitis media, pneumonia, acute rheumatism, &c., and here also there are some large sex differences in incidence. The boys suffered twice as frequently as the girls from otitis media, two and a half times as frequently from pneumonia, and eleven times as frequently from acute rheumatism (the last is based upon rather limited figures). These differences in serious illnesses may be derived, at least in part, from the stricter supervision of the girls, already mentioned, which would lead to their being kept out of school more frequently for minor infections and isolated at an earlier stage of illness. In girls' schools there is also, probably, less close contact in the sleeping accommodation. At present the committee is not prepared to interpret these observed differences but stresses the importance of discovering the underlying causes.

[1] Medical Research Council, Special Report Series No. 227. H.M. Stationery Office. Pp. 289. 4s. 6d. The committee was made up as follows: Sir George Newman (chairman 1930–35), Sir Arthur MacNalty (present chairman), Dame Janet Campbell, Dr. R. H. Crowley, Sir Weldon Dalrymple-Champneys, Surgeon Rear-Admiral S. F. Dudley, Dr. G. E. Friend, Dr. J. A. Glover, Prof. M. Greenwood, F.R.S., Dr. F. Griffith, Dr. L. R. Lempriere, Prof. W. W. C. Topley, F.R.S., Dr. Joyce Wilson (secretary).

COLDS

The weekly attack rates from nasopharyngeal infection show, with a fair degree of regularity, a rise to a maximum in the third or fourth week of the term, followed by a rapid fall, and then a tendency to a second but less important rise at about the tenth week. A possible explanation is a loss of immunity in the holidays, followed by an epidemic of colds under the renewed contact and exchange of nasopharyngeal flora on return to school; a temporary immunity thus results but wanes in time for a second outbreak towards the end of the term. By comparing the records of boys in six schools an attempt was made to see whether those who had suffered heavily from colds at one age caught more or less colds at a later age than their fellows whose earlier experience had been more favourable. No influence of previous upon subsequent experience could be found, and the subsequent history of boys who in any one term had had two or more colds was also not materially different from their experience before the term in which the multiple colds occurred.

INFLUENZA

A similar type of comparison can be made of boys who passed through two epidemics of influenza. It was found that those boys who contracted influenza in the first epidemic were more, not less, likely than their unattacked companions to contract the disease when again exposed to risk a year later. On the other hand, figures for an epidemic in the first term of 1932 showed a considerably lower attack rate (7·95 per cent.) on those who had been attacked in the previous Christmas holidays than on those who had escaped attack in the holidays (23·09 per cent. attacked in the term). A tentative explanation is that the attacked belong to a more susceptible class and are therefore more frequently attacked than their more resistant companions, in a later epidemic, taking place at least a year later than the first epidemic; but for a short interval of time they have a transient immunity conferred by the attack. In the influenza epidemics observed girls showed far less tendency than boys to develop such complications as otitis, sinusitis, and pneumonia.

COMMON FEVERS

The medical histories of previous experience show that, broadly, about 70 per cent. of the boys had had measles, chicken-pox, and whooping-cough before entry to the schools, about 30 per cent. had had german measles and mumps, and less than 10 per cent. scarlet fever. The corresponding figures for the girls are rather lower but of the same order. Of those attacked during school life the Lent term provides the most formidable number of cases, closely followed by the summer term. The Christmas term rarely produced cases of infectious disease. The maximum number of outbreaks began in the third–fourth weeks for the boys, the second–third weeks for the girls. It seems probable that such early outbreaks were introduced by a child infected at the end of the holidays and subsequently falling ill, but the possibility of carriers, particularly for scarlet fever, must be borne in mind.

A remarkable fact is the inability of a high proportion of outbreaks to spread at all. Limiting observation to outbreaks which had time to spread before the end of term, it is found that 34 per cent. in boys' schools and 41 per cent. in girls' schools were limited

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to one case. Similarly there is much variability between one epidemic and another and between one school and another. For instance, with measles the proportion attacked of susceptibles (no history of previous attack) varied from 12 to 70 per cent. Examination of seven pairs of epidemics of this disease gave support to Stocks's observations on the acquirement of a transient immunity without exhibition of a clinical attack. Children who had passed unscathed through one epidemic were more likely to escape attack in a second epidemic than those who had not been exposed to the first risk. There is some evidence of the same phenomenon, but on a lower scale, in german measles. This disease exhibited sometimes powers of spread equalled only in the present data by influenza, the cases tending to occur in two or three well-defined waves. Although approximately the same percentage of children had before entry passed through an attack of measles, chicken-pox, and whooping-cough, the commonest disease in boys and girls was chicken-pox, both with regard to the number of times it appeared and the absolute frequency with which it spread to the extent of causing an attack rate of 1·0 per cent. or over. Whooping-cough, on the other hand, was a comparatively unimportant disease and the number of cases relatively trivial. In accordance with past observations girls appeared to be more liable to attack than boys.

Although the proportions attacked by mumps before entry were low the disease showed no distinct tendency to spread widely, an observation which is still more striking with scarlet fever, which showed less inclination to spread than any other infectious disease except diphtheria. A large sex difference is also here shown. The boys reported 271 cases of scarlet fever, the girls only 27. Allowing for the fact that boys outnumbered girls in the ratio of 3 to 1 we might expect 81 cases among the girls. In other words the boys reported more than three times as many cases as the girls, a sex difference for which no explanation is forthcoming. In general these data on the infectious diseases suggest, as one would expect, that the chance of one of them gaining access to a school is dependent, in part at least, upon the size of the population. Another observation of interest is the considerable difference between the infectious diseases in their ability to work themselves out before the end of term. About half the outbreaks of measles came to a natural conclusion, while no epidemics of german measles and only a small proportion of mumps, chicken-pox, and scarlet fever could be said to have ended before the holidays began. With an almost unlimited supply of susceptibles outbreaks of german measles, mumps, and scarlet fever might well be expected to drag on, but the difference between the behaviour of measles and chicken-pox is odd since the proportion of susceptibles to these two diseases was approximately the same—about 30 per cent.

OTHER DISEASES

Gastro-intestinal disorders show their highest incidence—43 per cent. of their total—in the Christmas term, the remainder being fairly equally divided between the Lent and summer terms. Another cause of school absence with a high incidence for boys in the Christmas term was trauma, which produced in total—i.e., on the figures for the whole year—9·4 per cent. of all lost time among boys and 4·8 per cent. among girls. In the Christmas term the figure for the boys rose to 17·8 per cent., or about half a day per pupil, while with the girls there is no pronounced seasonal change. Epidemic catarrhal jaundice was encountered on a large scale at two schools and fairly frequently when confined to but one or two cases. The available evidence confirms Pickles's conclusion that it has a rather long incubation period, three to four weeks or even longer. Its incidence was low in the summer term and also fell nearly three times as heavily on boys as on girls. In the Lent term of 1934 epidemic conjunctivitis became widespread and caused a considerable amount of lost time in both boys' and girls' schools. Ringworm of the scalp or body was rarely reported but there was a fairly wide prevalence of tinea cruris, the incidence of which most medical officers think has increased since the war. In the present experience 40 per cent. of the cases fall in the summer term and it was found that on the whole the schools which isolated patients until cured suffered lower attack rates than those which permitted school attendance during treatment.

TIME LOST

Taking all causes of illness together we find that in the boys' boarding-schools 3·2 days were lost per boy per term, in the girls' boarding-schools 3·8 days. In the former variations between schools were from 5·1 to 2·2 days, in the latter from 4·3 to 3·0. Colds and influenza added together accounted for 53 per cent. of time lost by the girls and for 43 per cent. of time lost by the boys. All rates except those for trauma tended to decline with advancing age, as one might expect as the result of increasing herd immunity. Bacteriological work carried out on behalf of the committee by Dr. F. Griffith of the Ministry of Health leads to some interesting epidemiological observations. He found that in one school, during a period of four years, there were six separate invasions by different types of hæmolytic streptococci, each type appearing suddenly and gradually dying out, leaving behind a few chronic carriers. Does the disappearance of an epidemic strain from such a community mean that those susceptible to infection with this type had been attacked or become insusceptible through a concealed infection? Does the particular strain lose its invasive properties and become unable to infect and produce disease in normal throats though present in the chronic carriers? The great majority of these streptococcal outbreaks occurred in the Christmas and Lent terms and the summer term and the summer vacation appeared to interpose a barrier to the extension of types then present.

ONLY A BEGINNING

Such in short are the data that the committee has accumulated and analysed. At present they have made no attempt to establish correlations between particular sickness rates and particular environmental factors which might be altered or controlled. For the interpretation of seasonal variations, sex differences, and school differences they regard their data as still too few. Their inquiry is proceeding and it is the committee's intention to continue the collection of these sickness records on a somewhat more restricted scale while investigating in greater detail the problems which the present facts have stressed. If, for instance, the present differences between schools are found to be repeated over a further period of years, then it would be reasonable to regard them as real differences dependent upon environmental factors which detailed inquiries might detect. The committee also proposes to correlate growth rates of pupils, as measured by gain in weight,

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with the sickness incidence experienced. The conclusion is that "by continuing the inquiry over a much longer period, so that significant differences or trends can be distinguished from those that are transient and random, and by following up particular problems, it should be possible, at least, to lay a foundation of well-documented evidence that will serve as a basis, certainly for further studies, and possibly for administrative action."

AUSTRALIA

(FROM OUR OWN CORRESPONDENT)

THE ELIZABETH KENNY METHOD

FOR some years Miss Elizabeth Kenny has been practising in Queensland a method devised by herself for the treatment of paralysis, and has roused both public opinion and medical interest with her optimism about the effects of her treatment. Two years ago a Royal Commission was appointed by the Queensland State Government at Miss Kenny's request to inquire into her method, and the report of the Commission has now been issued. The terms of reference were to investigate the modern methods of treatment of infantile paralysis, and other diseases of a paralytic nature, and to investigate in particular the Elizabeth Kenny method of treating infantile paralysis, spastic paralysis, and birth palsy, and to compare the results of this method with the results of orthodox treatment. The personnel were selected by Miss Kenny. The main conclusion reached is that the method differs essentially from current practice in only two points—the early movement of the limb during the stage of muscle tenderness, and the refusal to accept the principle of supporting every paralysed muscle by suitable splinting.

Miss Kenny has certainly had some measure of success with her work at the several clinics established in Queensland, but it is felt by the Commission that this is due to the intensity rather than the nature of the treatment. She has been liberally supplied with Government funds totalling approximately £25,000, which has allowed a large staff and consequently frequent attention. The Commission see no reason to doubt that given the same intensity of treatment orthodox methods would have produced equal or even better results, and that some of the patients who became worse would not have done so under orthodox treatment. As to the psychological aspect, Miss Kenny lays down as one of her fundamental principles the maintenance of a "bright mental outlook," and she develops this to the utmost. The clinics are equipped with porcelain baths, colourful appointments, uniformed trainees, and free transport is arranged; and patients converse with each other in an optimistic and cheery atmosphere. Furthermore, the Commission note that the dominant figure of Miss Kenny herself, her strong personality, her own conviction of competence, and promises of cure—all tend to create an atmosphere generative both of faith and hope, and particularly of loyalty to Miss Kenny.

While conceding credit to Miss Kenny for drawing attention to the plight of crippled children, and for her effort to secure organised treatment of cripples, the Commission feel that an exaggerated status has thereby been given to infantile paralysis in popular opinion, to the exclusion of other crippling conditions that may benefit more largely and more permanently by a similar expenditure of Government funds.

TRUBY KING

The death of Sir Truby King, famed for his child welfare work and founder of the Plunket scheme of mothercraft and child welfare, recalls the difficulties he had 30 years ago in overcoming the accusations levelled against him of being a crank and a fraud. His first interest in baby welfare was developed through his successful work among dairy calves on the farm belonging to the mental hospital of which he was then superintendent. He found that, by instituting a system of "rational, scientific, artificial feeding" for the calves, based on the percentage composition (and in particular the protein ratio) of average cow's milk, he was able to eliminate completely death from "scouring" among the calves. So successful were the experiments with calves that Sir Truby applied the same system of percentage feeding to human infants, using human milk as a standard instead of cow's milk. The results obtained were remarkable and within a few years mortality from diarrhœa in New Zealand was reduced to practically nothing; and within a few more years his method of feeding had adherents all over the civilised world.

THE CIVILIAN POPULATION AND CHEMICAL WARFARE

The New South Wales Post-Graduate Committee in Medicine recently arranged for a course of four lectures, dealing with the protection of the civil population against gas attack, to be given on the following subjects: chemical warfare and the general requirements of a civilian gas defence scheme; physiological effects of war gases and first-aid treatment for gas casualties; blister gases—individual and collective protection; material decontamination; organisation, scope, and control of air-raid precautions; and first-aid services. A number of similar lectures have been delivered recently in scientific and military circles, dealing with the education and protection of the public against gas attacks in warfare. The problem of producing a satisfactory and workable civilian gas defensive scheme is not an easy one to solve; but the more that people generally understand what must be faced, the easier it will be to secure coöperation for such a plan and to reduce panic in time of emergency. At present supplies of anti-gas respirators and protective clothing are available only for members of the police force, essential services, and for members of military organisations. The best form of protection for the population at large is to ensure that they remain indoors during the progress of a raid and until the all-clear signal is given.

PARIS

(FROM OUR OWN CORRESPONDENT)

THE CHEMOTHERAPY OF GONORRHŒA

THE conference of experts in gonorrhœa just held at the Ministry of Public Health under the auspices of the Conseil Supérieur d'Hygiène Sociale devoted nearly all its attention to the treatment of gonorrhœa with sulphanilamide et hoc genus omne. One purpose of this conference was to clear the air in preparation for the general meeting of the International Union against Venereal Disease to be held this month. Prof. Gougerot presided over the conference, which was attended by Prof. Levaditi, Prof. Janet, and many others whose names are familiar in association with chemotherapy or gonorrhœa. The conference will be resumed in December. The practically

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unanimous conclusions to which it came last month were that the sulphonamide group promises to achieve a very appreciable advance in the treatment of gonorrhœa, but that the risks of serious poisoning are so great that indiscriminate medication by the public without medical control is to be emphatically deprecated. This latter point was underlined at the end of the conference by the unanimous adoption of a resolution to the effect that the sulphonamide group of drugs should be considered as toxic, and that a limit should be put to the duration of their prescription. At present, these drugs can be bought in France without a prescription, and in order to protect the public from the dangers inherent in this state of affairs one speaker suggested that the dosage should not be indicated on the wrappings, and that they should give a warning as to the possibilities of poisoning. In this connexion it may be noted that one speaker had found 50 per cent. of his patients show some slight degree of intolerance, and 10 per cent. more alarming signs such as severe headache with giddiness, intense cyanosis, anæmia, or neutropenia.

POST-GRADUATE LECTURES IN ENGLISH

Prof. H. Hartmann, president of the Association pour le Développement des Relations Médicales entre la France et les Pays Etrangers, has drawn up a very attractive programme of post-graduate lectures to be given in English by leading members of the French medical profession during the latter part of June and the first half of July. These lectures will be given either at the Faculté de Médecine or in the Paris hospitals. The subjects dealt with will be cardiology, ophthalmology, gynæcology, endocrinology, pædiatrics, neuro-psychiatry, dermatology, histology (at the Cancer Institute at Villejuif), medico-surgical physiology, urethro-pyelography, abdominal surgery, and operations on the cadaver. Further details may be obtained from the bureau of the association, Salle Béclard, Faculté de Médecine, Paris VI.

IRELAND

(FROM OUR OWN CORRESPONDENT)

AN ACTION FOR DAMAGES

RESERVED judgment was delivered in the Supreme Court last week in a case in which a boy of 10, suing by his father, appealed from a judgment of Mr. Justice O'Byrne in favour of Dr. Mary Byrne, whom he had sued for damages, alleging negligence in her medical and surgical treatment of him while she was resident medical officer in the County Hospital, Wexford, in 1936. The defence was a denial of negligence and a plea that the action, not having been begun within six months after the alleged neglect, was debarred by the Public Authorities (Protection) Act, 1893. Despite expert evidence that the treatment—the setting of a broken arm—was skilfully and carefully given, the jury found for the plaintiff and assessed damages at £400. The judge, however, was satisfied that Dr. Byrne was protected by the Act referred to, and directed judgment for her. The Supreme Court unanimously upheld this judgment. Mr. Justice FitzGibbon, who read the judgment of the court, said that without doubt the Wexford board of health, if they had been made defendants in the case, would have been entitled to rely upon the Public Authorities (Protection) Act. The duty to provide and maintain a hospital at Wexford for the treatment of medical, surgical, and maternity cases among persons in the county eligible for relief was a public duty imposed by statutory authority on the board of health. In making these provisions the board was acting in the execution of a public duty. That public duty could only be carried out by the board through the agency of subordinate officers, and such subordinate officers were entitled by statute to protection against actions for neglect or default in the execution of the duties entrusted to them by the board. The defendant, in his opinion, was acting in the execution of these public duties, and the alleged neglect or default with which she had been charged was committed, if at all, in the execution of such public duty.

MEDICAL MEMBERS OF THE NEW SENATE

The Senate of Ireland, for which the elections and nominations were completed last week, will contain four members of the medical profession. One was elected on the cultural and educational panel, one was returned by each of the universities, and one was nominated by the President. Dr. Patrick Joseph Doyle of Shinrone, Offaly, who was elected on the cultural and educational panel, is dispensary medical officer of the Shinrone district, and will be the only member of the dispensary service in the Senate. Dublin University elected as one of their representatives Dr. Robert J. Rowlette who formerly represented the same constituency in the Dáil. He is King's professor of materia medica and pharmacy in the School of Physic. The National University of Ireland elected Mr. Henry L. Barniville, professor of surgery in University College, Dublin. He was a member of the former Senate from its foundation to its abolition. The President nominated Dr. Robert P. Farnan, professor of obstetrics and gynæcology in University College, Dublin, and president of the recently formed Medical Research Council. Both Dr. Farnan and Mr. Barniville are members of the staff of the Mater Misericordiæ Hospital.

LONDON M.B., B.S.: NEW REGULATIONS

THE differences between the revised regulations for the London M.B., B.S., just issued, and those now in force are more fundamental than may appear at first sight. Perhaps the most important of the changes from the student's point of view is the division of the "final" into three instead of two parts, which will not only make the examination less formidable but will enable it to be spread over a longer period without increasing the length of the course. Quite apart from what may be termed structural changes, however, there are others of some moment, as will be seen below; for while the actual subjects in the syllabus remain largely unchanged there is in many places a shifting of emphasis, exemplified in the new clause inserted in the opening paragraph of the syllabuses for medicine, surgery, and obstetrics and gynæcology providing for instruction "in the methods of preventing disease." The additional time allocated to obstetrics is also a sign of the recognition of the need for more practical training in this subject.

The parts of the examination will be: Part I (1) Pathology, (2) Hygiene and Forensic Medicine; Part II (1) Medicine, (2) Applied Pharmacology and Therapeutics; Part III (1) Surgery, (2) Obstetrics and Gynæcology. The examination in Part I can be taken two years and six months after passing the second examination for medical degrees, and that

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in the other parts three years after; or all parts can be taken together at this later date.

PART I—PATHOLOGY. HYGIENE AND FORENSIC MEDICINE

(1) *Pathology.*—The compulsory introductory course is now to be in "pathology" instead of in "clinical pathology." The rest of the syllabus is unchanged except that the period of practical work in morbid anatomy, bacteriology, and chemical pathology, formerly specified as six months, is now unstated.

(2) There will still be a combined paper for *Hygiene and Forensic Medicine*, but there will be two oral examinations—one in public health and State medicine and one in forensic medicine and toxicology.

Hygiene.—The transposition in the order of the subjects in the title of this syllabus appears to indicate a deliberate plan to make the student's training more in accord with his future needs. The difference in the hygiene syllabus is so remarkable as to merit detailed quotation.

OLD SYLLABUS	NEW SYLLABUS
A course of instruction in Hygiene, including demonstrations extending over a period of not less than three months.	The course of instruction in Hygiene *should be designed to meet the needs of general medical practitioners*, and include the following:—
The principles of personal hygiene. Cleanliness. Clothing. Ventilation, exercise, sleep, diets.	The relation of the medical profession to the State. National Health Insurance practice.
The principles regulating the sanitary construction of the dwelling. Elementary consideration of sites, soils, ground air, ground water, exclusion of damp, disposal of excreta in town and country, drainage.	Local health authorities, their chief medical powers and duties, their relationship to the general medical practitioner; county and municipal hospital arrangements; public assistance.
Effects of overcrowding, damp, sunlight, dust, injurious occupations.	The organised health services: Maternity and child welfare; care of the school-child; the tuberculosis service; the venereal disease service; the care of mentally defective persons.
Diseases liable to be conveyed by water and food.	Infectious disease—what the health authority can do to help the general medical practitioner and what the practitioner can do to assist in prevention and control.
Ætiology and prevention of the more commonly occurring endemic and epidemic diseases, including isolation and disinfection. The following diseases at least should be dealt with: Measles, whooping-cough, mumps, epidemic diarrhœa, tuberculosis, scarlet-fever, diphtheria, enteric fever, small-pox, chicken-pox, cerebro-spinal fever.	The importance of the general medical practitioner in the collection of vital statistics; explanation of the simpler rates (birth, death, infant, and maternal mortality).
	National nutrition; control of milk-supplies; diseases conveyed by food; procedure in outbreaks of food-poisoning.
The power and legal obligations of the medical practitioner under public health legislation.	Effects of environment on health: Housing, ventilation, water-supplies, defective sanitation.
Elements of vital statistics, including the meaning and interpretation of birth- and death-rates.	Effects of occupation on health; duties of examining surgeons under the Factory Act; welfare work in industry.
Causes and prevention of infant mortality.	
Correct certification of the causes of death.	

Forensic medicine (and toxicology).—The elaborate syllabus for this subject previously detailed is now replaced by the pregnant sentence that the course "should be designed to meet the needs of general medical practitioners." It may be hoped that this general instruction will be interpreted to include teaching in the difficult problem of assessment of fitness for various kinds of work after injury or illness and of evaluation of compensation and insurance claims.

PART II—MEDICINE. APPLIED PHARMACOLOGY AND THERAPEUTICS

(1) *Medicine.*—The differences here are the insistence on a month's clinical teaching in the children's ward of a recognised hospital; the omission of materia medica and pharmacy from the list of subjects on which questions may be asked; and the addition to this list of physiotherapy, radiology in its application to medicine, and psychology in relation to medicine.

(2) *Applied pharmacology and therapeutics.*—This examination will consist of a paper of three hours and an oral examination on the following syllabus: The rational basis of medical treatment of diseases, the use of drugs, immunological products, hormones, diet, and physical methods, the principles of nursing, dispensing, and the writing of prescriptions.

Though the revised regulations for the first and second examination for medical degrees have not yet been issued, we understand that there will no longer be a separate examination in pharmacology as part of the second M.B., B.S.; that the separate organic chemistry examination which used to be Part I of the second M.B., B.S. will be dropped and that the scope of the examination in physiology will be extended so as to include biochemistry and elementary pharmacology. These changes would be in accordance with the recommendations in the report, issued in April, 1935, of the Medical Curriculum Conference, over which Lord Dawson presided.

PART III—SURGERY. OBSTETRICS AND GYNÆCOLOGY

(1) *Surgery.*—The change in the surgical curriculum is mainly in the addition of radiology in its relation to medicine to the subjects of instruction; the substitution of physiotherapy by mechanotherapeutics among these subjects; and the omission of a specified time (three months under the old regulations) for the duration of courses in ophthalmology and oto-rhino-laryngology.

(2) *Obstetrics and gynæcology.*—The minimum period of study devoted to clinical obstetrics and gynæcology has been extended from five to six months, of which four are to be devoted to obstetrics, including antenatal care and the hygiene of infants, and two (formerly three) are to be spent as clinical clerk in the gynæcological wards and out-patient department. Two of the four "obstetric months" are to be spent in a maternity ward or hospital, preferably in residence. Practical instruction in the principles of ante- and postnatal care, the management of the puerperium, and the care of the new-born infant are to be given throughout the six months.

OTHER CHANGES

In Part I a candidate who fails in one of the subjects ((1) pathology or (2) hygiene and forensic medicine) will only have to take that subject again; but this does not apply to Part II or Part III in which both the subjects making up the part have to be passed at the same time. Candidates will be eligible for honours if they have passed both subjects of Part I on the same occasion and Parts II and III at the next following examination, or if they pass all parts together.

The fee for the whole examination, which will be held, as hitherto, twice a year, in May and November,

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has not been fixed, but it will be slightly more than the 12 guineas fee now charged for the two parts. The first examinations in the new Part I of the M.B., B.S. will be held in November, 1938, and in Parts II and III in May, 1939. Candidates will be eligible for examination under either old or new regulations until May, 1940, after which the new regulations will prevail.

RHEUMATIC DISEASES

THE INTERNATIONAL CONGRESS AT BATH

AFTER the congress at Oxford (reported last week), a conference took place at Bath from March 31st to April 3rd. On the first evening the Mayor held a large reception at the pump-room, where Lord Horder gave a presidential address.

The conference had been arranged in connexion with the bicentenary of the Royal Bath Hospital, and Lord HORDER, in speaking of the work of that hospital, mentioned the need for its complete reconstruction in order to maintain its great tradition and prestige. He thought that Bath and other British spas had not yet been used to the full for the relief they offered to rheumatic disease. Although no complete estimates were available of the prevalence of the disease in this country about 400,000 insured workers a year were known to be prevented from following their occupations for the time being by it. The insured workers represented about a quarter of the total population, so the total number of sufferers could be safely taken as over a million. The medical profession should, he thought, combat the idea that British spas could not offer the same healing advantages as continental spas. This might encourage the well-to-do to use the home ones more; the British Medical Association and the British Spas Federation had been considering how the facilities might be extended, possibly by provision of hostels and approved boarding-houses for the poorer class of sufferers.

GOUT AND RHEUMATISM OF METABOLIC ORIGIN

Two of the sessions, over which Prof. F. R. FRASER and Sir HUMPHRY ROLLESTON presided, were devoted to discussions on gout and diseases of metabolic origin.

Sir WALTER LANGDON-BROWN recalled the phase when doctors either thought that uric acid was the cause of most diseases or that it was a by-product of normal metabolism, harmless to the majority of people. The latter view, he said, won the day but left us to wonder why some people undoubtedly suffered from gout. The diminished incidence was partly due to altered habits of living, eating, and drinking. The last time he had seen any considerable number of cases of gout was in 1919 when apparently some people had lost their tolerance for a full diet. But some of the diminution was only apparent, caused by more accurate diagnosis. He thought that a patient could hardly be called gouty if the blood uric acid were less than 3·6 mg. per 100 c.cm. Urinary purines were partly endogenous, partly exogenous, about 0·2 per cent. being excreted by a person on a purine-free diet. The richest source of purines in foods was the nucleoproteins in the more cellular foods. While ordinary meat contained only about 0·06 per cent. of purine nitrogen (beef 0·08 per cent. and chicken slightly more), liver and kidney contained 0·14 per cent. and sweetbreads as much as 0·42. Soft herring roes contained nearly 0·5 per cent. The colour of meat was no index of its purine content.

In evolution the power to synthesise urea had apparently been gained on migration to the land, when excretion of ammonia became impracticable; in the higher animals the amino-purines were broken down to uric acid and most animals could continue the breaking down to urea by means of uricase, an enzyme of the liver. Man, the anthropoid apes, and the Dalmatian hound shared the lack of this enzyme. Sir Walter suggested that some persons suffered from a congenital or acquired difficulty in disposing of their nuclein derivatives, the difficulty being not one of destroying but of eliminating purines, which was possibly due to the loss of power to conjugate them. This led to such an excess of uric acid in the blood that a low-grade arthritis was fanned into intense flame by the deposit of irritating biurate crystals in a structure already involved. The treatment by colchicum remained empirical, its effect being dramatic in an attack but useless to ward it off. Cinchophen averted attacks but its use involved serious risk of toxic jaundice.

Dr. M.-P. WEIL (Paris) reviewed the history of gout, but he maintained that the sharp differentiation between that disease and rheumatism was no longer acceptable. Gouty rheumatism was entitled to the same positions as tuberculous, dysenteric, and ovarian rheumatism. He thought the part played by disturbances in uric acid metabolism had been exaggerated, for even a moderate amount of certain drinks, cold, fatigue, moral indiscretion, traumatism, gymnastics, walking, and sometimes simple intellectual effort were in a predisposed person more disastrous than the absorption of sweetbreads, spinach, or cocoa. Rheumatism might be present for years before its nature was revealed by an attack of gout.

Dr. E. P. POULTON referred to Dr. W. Lloyd's test for predisposition to gout, which relied on measuring the blood uric acid in well-controlled circumstances after a high purine meal. The test had shown that a value of 3·8 mg. per 100 c.cm. was quite normal. Dr. J. FORESTIER (Aix-les-Bains) regretted that diagnosis was difficult, for gout had no typical constant symptom. Sir WILLIAM WILLCOX said that focal sepsis and chronic lead poisoning were important in ætiology; the blood uric acid on the other hand might be high without causing gout, as in the leukæmias. He confirmed Sir Walter's experience that cinchophen was apt to be poisonous, especially in old people; he had more than once known 5 grains given three times daily for a week prove fatal. Dr. C. W. BUCKLEY (Buxton) thought that acute gout might be an allergic manifestation.

Dr. LESLIE HILL (Bath) read the paper published elsewhere in this issue. Dr. HUBERT GIBSON gave a communication with Dr. G. D. KERSLEY, in which they concluded that no test or group of tests had yet been found which gave positive diagnostic information on borderline cases of gout. These merged into other forms of chronic rheumatism. A high blood uric acid after a standard high purine diet might be suggestive of gout; the response to ephedrine and Bellafoline was not in striking contrast to the effect of ergotamine tartrate and pilocarpine (to produce vagotonia). So-called gouty teeth had proved indistinguishable from those from non-gouty people; the X ray changes—the well-defined punched-out areas, the less definite small areas under cartilage, and the periostitis—could all be found in cases of rheumatoid arthritis. Radiograms of the hands closely resembling gout had been seen especially in rheumatoid arthritis complicated by chest infections, probably tuberculous

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in origin, but the interrelationship was difficult to determine.

Dr. NAJIB-FARAH (Alexandria) related the decline in gout with the increased prevalence of sport. Dr. F. COSTE (Paris) thought the manifestations of gout might vary from country to country. Mr. JOSEPH RACE, D.Sc. (Buxton) mentioned the inheritance of gout and the disease's geographical distribution as evidence of its distinct character. Dr. D. COLLINS said that from the point of view of morbid anatomy the events preceding the deposits were of greatest interest; there was an acute inflammatory reaction, accompanied in joints sometimes by a polymorphonuclear exudate. Dr. ANDRONESCU (Rumania) thought that inadequate respiration played its part in maintaining gout. Dr. GUNNAR KAHLMETER (Sweden) said that in his country gout was not common and he had seldom been able to obtain a family history of it. Dr. J. VAN BREEMEN (Amsterdam) thought the history of mankind would have been very different without gout, for many famous people had been sufferers—Wallenstein, Linnaeus, Vesalius, and Goethe being among them. Dr. ERNST FREUND (Vienna), whose paper was read in his absence, thought that neither diabetes nor obesity were related to gout, except that the latter might be evidence of over-feeding. The incidence of nephrolithiasis in gouty persons was however definitely high. Dr. C. H. G. PRICE (Bristol) reported five cases of heart failure which when treated with Salyrgan had developed gout at the time of maximum diuresis. Dr. FORESTIER (Aix-les-Bains) had noted a history of indulgence in alcohol in a large number of his cases. Dr. PHILIP HENCH (Mayo Clinic) thought that well-marked gout had usually been earned rather than inherited. The criteria he would uphold were the character of the attack and the response to treatment; high uric acid values and tophi were signs, not the cause, of a gouty attack. He thought irregular gout would be better called questionable gout.

Dr. R.-J. WEISSENBACH and Dr. F. FRANÇON described the radiographic appearances in some cases of classical gout.

JAUNDICE AND RHEUMATOID ARTHRITIS

At the third session of the conference, with Sir WALTER LANGDON-BROWN in the chair, Dr. HENCH spoke of the effect of spontaneous jaundice on rheumatoid arthritis. He said that jaundice involved a physiological reaction which was antagonistic to the continuation of active symptoms of rheumatoid arthritis and primary fibrositis. With the onset of any one of several types of jaundice, rather dramatic remissions in rheumatic symptoms, lasting 3–104 weeks, occurred in nineteen cases of rheumatoid arthritis, in nine of primary intramuscular or periarticular fibrositis, in two of lumbosacral and sciatic pain, and in one of secondary hypertrophic arthritis of the hips. Remissions averaged roughly from two to three times the average duration of the jaundice and affected symptoms of active disease; residual articular thickening and disability from deformity were however unaffected. The phenomenon depended more on the quantity than on the quality of the jaundice, a certain intensity of jaundice being required. Intercurrent jaundice of varying types and severity had not alleviated symptoms of certain other painful articular and neuritic diseases and so the phenomenon might be relatively specific for rheumatoid arthritis and fibrositis. Dr. Hench thought the phenomenon might have application in other conditions. The responsible agent and its mechanism had not been identified; bilirubin, bile salts, hepatic autolysate, and low diet (as in jaundice) had all been considered. It had been suggested that the patients were too ill to notice their joints, had been improved by rest, or had been dehydrated. In reality the patients had been more active. Several methods had been used to induce jaundice which had to be fairly severe. A method worked out by Thompson and Wyatt of administering bile salts intravenously had so far proved the best, but had not brought about the relief given by spontaneous jaundice. Regardless of the supposed validity of the infectious theory, rheumatoid arthritis and fibrositis could obviously be profoundly influenced by an occurrence primarily chemical. Though the pathological changes might be permanent their pathological physiology was more rapidly reversible than had been supposed.

After a brief discussion of Dr. Hench's paper Prof. STANLEY DAVIDSON (Aberdeen) put forward a motion for debate, arguing that the incidence of rheumatic disease in this country and in Scotland was so great that the full accommodation for treatment, diagnosis, and research could not be within the scope of the voluntary hospitals.

Prof. RALPH PEMBERTON (Philadelphia) discussed vascular changes in relation to arthritis.

The social round at the conference was full. Two dances at the pump-room with a glimpse through the window of the steaming spring floodlit with two colours, a civic banquet, two cocktail parties (given simultaneously in five or six houses), a demonstration of spa methods and of cases, and several excursions were all part of this strenuous conference.

MEDICINE AND THE LAW

Doctor of Science but not of Medicine

A LIBEL action sometimes invites decision of an issue which is more than personal. In Mellor *v.* Medical Defence Union, for instance, there arose the general question of the propriety of using the title "doctor" in circumstances where it might be misleading. Miss Ethel Mellor is a distinguished doctor of science. She was the first British woman to obtain this degree at the University of Paris. She is also an Associate of the Royal College of Science (of botany) in London, and—a qualification which perhaps she will forgive us for mentioning last—a doctor of osteopathy of a college in America. She "practises the healing art," to use a phrase frequently heard during the trial, but she is not a registered medical practitioner. Her door plate in Welbeck-street bears only her name with the prefix "Miss." Her professional cards give this ampler description: "Dr. Ethel Mellor, A.R.C.S., D.Sc., D.O., Osteopathic Practitioner, 13, Welbeck Street, London, W.1." As the initiated are aware, there is not the slightest reason why an unregistered practitioner should not practise the healing art. Parliament, however, has deliberately created a Medical Register on which the names of duly qualified practitioners are placed. The reason for this step, as the Medical Act expressly states, is the expediency of enabling the public to distinguish between qualified and unqualified practitioners. Section 40 of the Act makes it an offence to do various things which obscure that distinction. Inter alia the unregistered practitioner is forbidden by Section 40 to use "wilfully and falsely" the name or title of "Doctor of Medicine" or any name, title, or description implying that he is registered under the

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Act. In this connexion the Medical Defence Union invited Miss Mellor, "in view of the recent decision which was secured at Brighton in the Deacon case," to undertake not to use the description "Dr." in front of her name, since the Brighton decision had held this to be an infringement of Section 40 and since the description could be confusing and misleading to the public.[1]

Miss Mellor, however, carried the war into the enemy's camp by issuing a writ for libel. By this letter, and by others which followed, she claimed that she was defamed. The letters meant that she had no right to her title of "Dr.," and was unlawfully, falsely, and wilfully using it, implying that she was a doctor of medicine or a registered medical practitioner, that she was dishonourable, had no learning, qualifications, experience, or credentials, and that she was actuated by base motives and used the title of "Dr." for fraudulent purposes. Though she conducted her own case, she showed great technical skill in the framing of this innuendo. The defendant union countered with the usual defences, denying that it published the letters, denying the innuendo, and pleading that the words complained of were privileged and were incapable of any defamatory meaning. When the plaintiff had completed her case, the Lord Chief Justice accepted the submission, made on behalf of the Medical Defence Union, that there was no case to go to the jury. The words complained of, he said, were not reasonably capable of a defamatory meaning. Even if the words had been defamatory, they were, on Miss Mellor's own admission, published on a privileged occasion, and there was no evidence of malice on the part of the defendants. Judgment was therefore given for the defendants with costs.

Miss Mellor had put her case with all possible force. She admitted that she was not, and never had been, on the Medical Register and that she held no qualification for admission to the register. In effect she claimed that she had fairly won the title of "Dr." and that the Medical Act could not deprive her of it. There are, of course, many kinds of doctorate. The question is whether the public, accustomed to address as "doctor" everyone who practises the healing art, will appreciate that the prefix "Dr.," if used by a practitioner professionally, is not meant to imply a doctorate of medicine. Logically, one feels, Mr. Jones, a doctor of music, or Mr. Smith, a doctor of law, might put up their plates in Harley-street, if they decided to take up the practice of the healing art, with the description "Dr. Jones, Mus. Doc." or "Dr. Smith, D.C.L." On Miss Mellor's contention they would be outside the reach of Section 40. There would naturally be the usual duty upon the prosecution to satisfy a court that the law had been infringed and that the public would be misled. The locality in which the descriptions were displayed might be some evidence in itself. Miss Mellor not unreasonably claimed that, *quâ* doctor of science, she had a title not to be obtained without a wide knowledge of the healing art. To that extent her case might be much stronger than the case of Mr. Jones and Mr. Smith. On the other hand the closer a doctorate of science is to a doctorate of medicine, the greater the need perhaps to avoid confusion. From Miss Mellor's point of view the strength of her position was that she could say "I am a doctor; therefore I can use the title of doctor." This contention is not far removed from Captain Barrow's argument in Jutson *v.* Barrow (1936) when in effect he said "I am a manipulative surgeon and I challenge the Medical Defence Union to prove that I am not." A closer parallel is Ellis *v.* Kelly (1860), where the defendant, possessing the degree awarded by a Bavarian university, called himself simply "Dr. Kelly" and the justices thought that he was entitled to do so on the supposition that he held the degree. The prosecution of Kelly is something of a mystery for reasons given by Mr. Justice Humphreys in Jutson *v.* Barrow; but it is noteworthy that Baron Bramwell, who delivered a judgment favourable to Kelly, afterwards in Andrews *v.* Styrap indicated some change of mind. The Andrews case was one where the plaintiff had not the justification of possessing a degree. The one thing certain in Mellor *v.* Medical Defence Union is that Miss Mellor possessed an important degree and had no intention to confuse the public. But, as was patiently explained by Lord Hewart in Jutson *v.* Barrow, the words "implying that he is registered" in Section 40 are words not purporting to describe the intention of the individual but are words describing the effect of the title on the public. If the appellation "Dr." carries with it the implication referred to in Section 40, the intention of the individual is immaterial. The section was passed to protect the public; the question is what meaning the appellation will convey to the public.

[1] See *Lancet*, 1936, 1, 683.

A Year's Crime

The annual Criminal Statistics for England and Wales (Cmd. 5690. H.M. Stationery Office. (3*s.* 6*d.*) deal with the year 1936. In less than 1 per cent. of the total of all offences is the charge serious enough to go before a jury. More than half the offences are traffic offences. Real crime—that is to say indictable offences, mostly thefts—account for only 9 per cent. The remainder includes such matters as breaches of by-laws, failure to take out dog licences, Sunday trading and betting offences, and infractions of the laws regarding intoxicating liquor. Juvenile crime is still rising. Among offenders under 17 charged with indictable offences the figure per 100,000 of population has climbed from 481 in 1934 to 597 in 1936; over 17 the rate is falling. There are more larcenies in 1936, more sexual offences, and more cases of violence against the person. Murder remains at its characteristically stable figure. In 1936 there were 99 cases of murder known to the police. In 33 of them (involving 41 victims) the murderer or suspect committed suicide; in respect of 61 cases 64 persons were arrested; in 5 cases no arrest was made. What happened to the 64? Ten were found "not guilty"; 23 were convicted and 8 of these were executed. Once more the mental state of the accused gives the community serious occasion for thought. Twenty of the 64 either were acquitted or were accounted for by death before trial, discharge at the police-court, or arrest and disposal abroad. Of the remaining 44 no fewer than 28 are officially shown to have been affected by various degrees of insanity. Eleven were found insane when called upon to plead; 15 were found, in the law's ridiculous formula, "guilty but insane"; two, after being sentenced to death, were certified insane and removed to Broadmoor. It is disquieting to find how many lives are sacrificed through the uncontrolled liberty of the mentally unstable or, to put it in another way, our failure to diagnose and treat mental instability.

SUICIDE

The statistics of suicide are remarkable and interesting. The number of verdicts of suicide in 1936 was 5007 as compared with 3474 in 1911; the correspond-

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ing figures of attempted suicides known to the police are respectively 3080 and 2313. The curious thing is that among men under 55 the suicide rate is lower in 1936 than in 1911, while over 55 it is a little higher, whereas among women over 45 there is a notable increase. The female figures per million of population show that in the age-group 15 to 20 the suicides were 38 in 1911 compared with 18 in 1936, whereas in the three age-groups 45 to 55, 55 to 65, and 65 and over, the 1911 figures are 109, 112, and 79 against the 1936 figures of 163, 161, and 113. What explanation have our social workers to offer?

GRAINS AND SCRUPLES

Under this heading appear week by week the unfettered thoughts of doctors in various occupations. Each contributor is responsible for the section for a month; his name can be seen later in the half-yearly index

FROM A CONSULTING PHYSICIAN

II

"Age and crabbèd youth cannot live together."

THUS H. W. Nevinson inverted Shakespeare's line after reading The Voice of Under Thirty in the *Spectator* lately. Many readers were distressed at the indecision and despair most of these youthful writers betrayed. But this is really nothing new. I remember that before the war the sea-green incorruptible *Westminster Gazette* published a series of articles entitled "Si jeunesse savait," much to the same effect. I have cheered many a gloomy adolescent by referring him to the preface of Keats's "Endymion," wherein he says that between boyhood and maturity "there is a space of life in which the soul is in a ferment, the character undecided, the way of life uncertain, the ambition thick-sighted; thence proceeds mawkishness and . . . [a] thousand bitters." It is reassuring for such a one to find that Keats, who accomplished so much, felt as he does now.

No doubt such feelings often find expression in a form which we seniors find distinctly unpleasing, but if we look back at our own youth we must in candour admit that our seniors must often have found us disagreeable while we were trying to assert our individuality. And we must remember that we grew up in a world which seemed relatively sane and stable. One great difference I do notice, however. In my time every college was honeycombed with little discussion societies where, aided by coffee and "whales on toast," we criticised a paper read by one of our number. To-day few such societies seem to exist—"if we have some time off we go to the cinema" one undergraduate told me—and such societies as do exist prefer to get a senior man to read the paper. Student medical societies too often do the same. What a valuable training they are missing. I always look back with pleasure to those "Noctes Ambrosianæ" when having

"tired the Sun with talking and sent him down the sky"

we put the world to rights. This education of one another by ourselves was surely one of the most valuable things in university life. Yet a young Oxford novelist, David Winser, makes a character say "With no one have I sat in front of the fire and talked into the small hours. And my uncles used to. Almost every night. No one at all except a Groupist. And even then it wasn't me who was talking." I can hardly credit, however, that undergraduates have ceased to talk! R. L. Stevenson said that it happened he had the very last of the very best of his old university which was the more strange as the same thing befell his father before him, and if he had a son doubtless it would also be his fate. This frame of mind exists because being at the university is like falling in love; no one can ever have had such an experience before, nor is it credible that anyone else can have it in the future. At a rational level, however, one knows that in many ways things have greatly improved there, but one doubts if the student can now lead so care-free an existence.

* * *

We seem to be reproducing the aftermath of the Renaissance. Of that great movement of the mind of man the late Sir Walter Raleigh wrote "from his servant's estate in the great polity [of Catholic theology] man was released and became his own master in chaos, free to design and inhabit for himself." Men believed that they could reap where they had not sown. Something similar is happening to-day; many theological dogmas have been set aside and again man felt himself set free from external bonds only to find he was not free from himself. In both instances there had been a phase of rapid expansion both in thought and in wealth followed by disillusionment on the intellectual side and greater stringency on the financial. On each occasion old standards were destroyed before adequate new ones could be provided in their place. On each occasion the world experienced the shrewd winds of disillusionment. The sword is not being beaten into a ploughshare; rather do hangars arise where once corn grew.

The effect of this on the younger generation is sometimes quite serious. C. P. Snow in his novel, "The Search," describes this effect upon the lives of a group of research workers. He makes one of them say "Your father and mother hadn't the certainty more or less that civilisation is going to crash in their lifetime. We have. . . . For you and me, for almost everyone life is fuller and richer than it has ever been. With one qualification. There is no hope. . . . Simple freedoms, but very precious . . . my sort of man has only had for an infinitesimally short time. They'll have gone from all over Europe except France and England and Scandinavia in ten years. From England in twenty. And for a very long time they will not come again."

* * *

We may think this picture is too black; the important thing is that it represents a not uncommon point of view and it is one which must tend to paralyse endeavour. Yet it should be remembered that there was an equally profound disillusionment produced by the events following the French Revolution. Edmund Burke said "the glory of Europe is extinguished for ever." Things looked black for Europe then as they do now, but the skies brightened again, as they may do yet. Science on the one hand offers material comfort, on the other, intellectual abstractions. This leads to a mechanised world without moral direction, with science as the handmaid of destruction. Fortunately we are not faced with the dilemma which must confront many a worker in the physical sciences—is he to go on with his researches without any reference to the probable ethical consequences? Of all the branches of biology,

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medicine can take the largest share in the reconciliation of science with ethics. That is why medical men feel that with all its drawbacks, it is a subject to which they can devote their lives with pleasure and satisfaction. William James said "the great use of life is to spend it for something that outlasts it." That profound satisfaction is ours. And I shall give myself the pleasure of quoting him again in sentences which have always sounded in my ears like a trumpet call. "For my own part I do not know what the sweat and blood and tragedy of this life mean if they mean anything short of this. If this life be not a real fight, in which something is eternally gained for the universe by success, it is no better than a game of private theatricals, from which one may withdraw at will. But it *feels* like a real fight—as if there were something really wild in the universe which we, with all our idealities and faithfulnesses, are needed to redeem; and first of all to redeem our own hearts from atheisms and fears. . . . Be not afraid of life. Believe that life *is* worth living, and your belief will help create the fact."

PUBLIC HEALTH

The Caravan Menace

CARAVAN encampments often cause local authorities anxiety not only because of the difficulty of getting rid of them but because of the menace to public health. Caravans are dumped on sites for use during the summer season and there they remain. An action at the Sussex Assizes at Lewes on March 30th resulted in the judge finding that the action of the Battle rural district council in removing a caravan at Winchelsea was justified under its powers under Section 27 of the Public Health Act, 1907, and judgment was given in its favour. The owner of an abandoned caravan claimed damages for alleged trespass in respect of its removal. He and other members of the Caravan Association relied, and said they were protected, by a decision of Mr. Justice Atkinson. They said if the caravans must not be inhabited they would get out and would promise not to inhabit them again, and would put them up for sale. It transpired during the hearing of the case that there had been a case of typhoid fever on the encampment. It was found to be a contact case from outside, but it might have led to a serious epidemic. This fact, no doubt, weighed with the council in deciding to exercise its powers, and the result has justified the principle involved. Having established its principle, Mr. Justice Greaves-Lord said, in giving judgment, the case was one which must have an effect on local opinion which could not be disregarded.

Section 27 of the 1907 Act has been replaced by Section 53 of the new Public Health Act. The drafting committee which produced the consolidation Bill said that the usual instance dealt with under Section 27 was the private garage. The section was concerned with buildings constructed of short-lived materials. For the present provisions about "tents, vans and sheds" reference must be made to Part XI of the 1936 Act. Here Section 268 (reproducing Section 9 of the Housing of the Working Classes Act, 1885, as extended by Sections 43 and 50 of the Public Health Act, 1925) enables any tent, van, shed, or similar structure used for human habitation to be dealt with as a statutory nuisance if it is either overcrowded to the prejudice of the inmates' health or so used that, by reason of the absence of proper sanitary accommodation or otherwise, it gives rise to a nuisance or to conditions prejudicial to health. Section 269, which controls the use of movable dwellings, follows precedents in local Acts. Here the main Parliamentary discussion arose over the propriety of applying it to all rural district councils, one of which (Easington) had already obtained it by local Act. The Parliamentary committee which examined the proposal was told that there were two types—one the semi-permanent encampment which becomes almost a slum, often occupied by gipsies and similar inhabitants, the other the seasonal holiday-makers' encampment where visitors come in relays all through the summer with results which are sometimes unsatisfactory. This section has a special subclause whereby the Minister can exempt a camping association which undertakes to control its members and to see that their camp-sites are properly managed and kept in good sanitary condition. The law as a whole does not press hardly upon the reasonably well-behaved camper. Indeed the Physical Training and Recreation Act of last year encourages local authorities to acquire and equip holiday camps and camping sites and even to engage and train wardens and leaders to secure that effective use is made of such facilities.

Red Cross Clinic for Rheumatism

The clinic in Peto-place which was opened by the British Red Cross Society eight years ago is finding that demands have outstripped its accommodation. During 1937 the treatments given in the general department amounted to 134,000, in the private patients' department to over 11,000, and increasing use was made of the various specialist departments. The medical board report that the lack of in-patient facilities is proving a handicap in the treatment of the more advanced cases; little provision has so far been made for such patients in general hospitals. Many patients, especially those with early manifestations of rheumatoid arthritis, would be greatly benefited by a protracted period of convalescence but there is still no place to which they can be sent. The evening sessions intended to allow patients with early rheumatism to attend for treatment without missing their work have been well attended and there are signs that the importance of early treatment is becoming increasingly appreciated. It is difficult to assess results at the clinic, depending as they do largely on such factors as the stage of the disease when the patient comes for treatment, his occupation, economic status, domestic conditions, and general health; but of the 700 men and 1100 women who completed their course of treatment in 1937, 36 per cent. were free from subjective symptoms, 49 per cent. were definitely improved, 14 per cent. were unchanged, and only 1 per cent. were worse.

The New Zealand Medical Service Scheme

We noted recently[1] the anxiety of the medical profession in New Zealand at the promotion by the Government party of a scheme of medical service which would virtually abolish private practice. The scheme has now taken definite form. The New Zealand government, according to a recent broadcast by the Prime Minister, Mr. Savage, is proposing to introduce a national insurance scheme for all which will include the services of a doctor, hospital, sanatorium, mental hospital, and maternity treatment, and later, if practicable, the provision of

[1] *Lancet*, Feb. 19th, p. 447.

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specialists, dentists, opticians, and home nurses. Everyone over 60 will be entitled to a pension of 30*s.* a week and there will be pensions of the same amount for invalids, of 25*s.* a week for widows, and 15*s.* a week for orphans. The scheme will be financed by converting the present unemployment tax of 8*d.* in the pound on all incomes into a "social security contribution" of 1*s.* in the pound, and adding pound for pound to the fund from the general revenue. According to the *Times* the cost is likely to be £16,000,000 a year.

Identification Card for Diabetics

The New York Diabetes Association has prepared [1] an identification card to be carried by diabetics taking insulin. The card is 2½ in. by 4 in. and on one side bears the following text:

Notice.—In case of emergency. The bearer of this card has diabetes and is using insulin. In case of sudden faintness or unconsciousness give 2 tablespoons of sugar dissolved in a glass of water, and call a doctor.

On the reverse is space for the name and address and telephone number of the holder and his doctor, and there follows a certificate to be signed by the doctor stating that the patient is legally entitled to own and use a hypodermic syringe for the administration of insulin. There would seem to be room for the extension of this scheme to those liable to such things as recurrent syncope, epilepsy, Stokes-Adams disease, and even perhaps alcoholic coma. Unfortunately there would be no guarantee that the diagnosis given on the card was the correct one.

[1] *Quart. Bull. N.Y. Cit. Dep. Hlth*, 1937, 5, 10.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED MARCH 26TH, 1938

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 2 (Gravesend 1, Port of London 1); scarlet fever, 2167; diphtheria, 1404; enteric fever, 13 (22 "expected"); pneumonia (primary or influenzal), 1254; puerperal pyrexia, 191; cerebro-spinal fever, 43; acute poliomyelitis, 3; acute polio-encephalitis, 1; encephalitis lethargica, 3; relapsing fever, 1 (Whitley U.D., Northumberland); dysentery, 92; ophthalmia neonatorum, 93. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on April 1st was 5693, which included: Scarlet fever, 838; diphtheria, 1128 (carriers 48); measles, 2339; whooping-cough, 307; puerperal fever, 17 mothers (plus 10 babies); encephalitis lethargica, 282; poliomyelitis, 1. At St. Margaret's Hospital there were 14 babies (plus 28 mothers) with ophthalmia neonatorum.

Deaths.—In 125 great towns, including London, there was no death from small-pox, 1 (0) from enteric fever, 67 (23) from measles, 6 (3) from scarlet fever, 13 (1) from whooping-cough, 27 (8) from diphtheria, 47 (18) from diarrhœa and enteritis under two years, and 78 (9) from influenza. The figures in parentheses are those for London itself.

Coventry reported the only death from typhoid. Measles was fatal in 25 great towns; Liverpool reported 5 deaths, Newcastle-on-Tyne 4, Manchester and Plymouth each 3. Diphtheria was fatal in 16 great towns, Manchester reporting 3 deaths. Eight fatal cases of influenza were reported from Birmingham, 5 from Bristol.

The number of stillbirths notified during the week was 283 (corresponding to a rate of 40 per 1000 total births), including 31 in London.

OBITUARY

THOMAS ALEXANDER McCULLAGH, M.R.C.S., J.P., D.L.

Dr. McCullagh had long been an outstanding figure in South Durham and his death at the age of 85 closes a life of wide interests and sympathies. He was the son of Thomas McCullagh, a distinguished Wesleyan divine, and was sent to Guy's Hospital to study medicine. In 1876 he became M.R.C.S. Eng., and two years later he took the licence of the Edinburgh College of Physicians. Meanwhile, after working for a short time in Liverpool, he had gone to Bishop Auckland as junior partner to Dr. John Jobson. This was in 1877 and he remained in the same practice until 1923, since when it has been carried on by his son. He will be remembered as a fine example of the old school of country doctors. He was both a reader and a sportsman, keen on riding, hunting, shooting, racing, and golf; courteous, gentle, and erudite, he yet had pursuits that enabled him to meet on their own ground any of the many types of patient encountered in the large area of his practice. "His was a great presence in the sick room," writes a colleague, "and his reputation extended far beyond the area in which he worked. His practice included attendance on many county families in the more prosperous days of Durham county, and he was thus brought into contact with many distinguished figures in various walks of life—political, social, artistic—of whom he had many reminiscences." As soon as he went to Bishop Auckland he joined the Volunteers as regimental surgeon, and when the Volunteers were merged with the Territorials he continued his service with rank as lieut.-colonel, receiving both the Volunteer and Territorial long service decorations. One of the oldest members of the Bishop Auckland bench, he was medical officer of health for the town until last year, and was a deputy-lieutenant for the county.

The Bishop of Durham, Dr. Hensley Henson, who became Dr. McCullagh's friend and frequent companion, writes of his conversation on books, birds, and politics, and of his omnivorous but discriminating tastes as a reader. "More than most men whom I have known," he says, "he combined the urbane manner and tolerant habit of a man of the world with the genuine piety and religious habit of a true Christian. He was, indeed, both. His long acquaintance with 'all sorts and conditions of men' had made him take an indulgent view of normal humanity, but it had deepened his belief in Christianity as the deepest truth for man. . . . Bishop Auckland was proud of the stately old man, whose presence added dignity to the rather drab aspect of the town. His absence will be felt and lamented."

Dr. McCullagh married in 1878, and his wife, the eldest daughter of Richard Bowser, died only a few months ago. There were four children—Commander A. B. McCullagh, R.N., who died in 1936, Colonel H. R. McCullagh, D.S.O., Dr. Cecil McCullagh, D.S.O., and a daughter, Mrs. Favell.

THE LATE MR. A. W. CUFF

Prof. MILES PHILLIPS writes: "Many of Archibald Cuff's friends would like some record of his personal attributes to be added to the account you have already given of his professional career. Children loved him dearly, treating him rather as one of themselves; they looked forward to parties when he would conjure for them with a skill that few amateurs possess. His great pleasure was painting; as a boy he painted his dogs, and he started again with small water-

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colour sketches one summer holiday in Cornwall, and for years after his happiest hours were spent in a cornfield or other country spot. Collecting old china was his chief hobby, and experts were often glad to have his opinion about some piece they were not sure of.

"His patients trusted and loved him; he would pay them 'unprofessional' friendly visits, and cheer them by talk on general topics. He was sympathetic and yet would not allow them to make too much of pain. We only knew how well he practised what he preached when he became ill himself. In spite of losing the use of his right hand, and so being cut off from painting, and being word-blind and so unable to read, he was unfailingly plucky. What pleased him most in those sad years was to be asked advice about some difficulty—a personal anxiety to be solved, or just the right word to be found for a paper that had to be written. Strangely enough, although he could not read he was particularly good at finding the right word, and it gave him pleasure and pride to be able to do it."

THE LATE DR. THOMAS ROSE

Dr. A. Knyvett Gordon writes: "May I add to your obituary notice of Dr. Thomas Rose by mentioning a side of his activity which was perhaps not generally known. I refer to his great skill and experience as a morbid anatomist. As a pathologist to many coroners, his work was very good indeed. His post-mortems always reminded me of an expert surgical operation. He was one of the best dissectors I ever knew, and his subsequent evidence in court was a model of lucidity. His experience was great, and a text-book from his pen would have been a valuable contribution to the literature of morbid anatomy. Unfortunately none of his intimate friends could ever persuade him to publish anything.

CORRESPONDENCE

NUTRITION AND DISEASE IN DENMARK

To the Editor of THE LANCET

SIR,—In an article which appeared in THE LANCET of Feb. 5th Dr. Johanne Christiansen comes to the conclusion that "Hindhede's theory that the excellent health of the Danes during 1918 was due to a sparse and largely vegetarian diet enforced by war rationing is not justified by the facts." It is, I agree, good for the Danish farmer that Englishmen should believe in our eggs and bacon, but Dr. Christiansen has, to my mind, misled your readers about nutrition in Denmark during the late war. Although she has succeeded in persuading the Danish Department of Statistics to make a calculation showing that the consumption of meat in 1918 was greater than the normal, the truth remains that it was in fact far lower.

The discrepancy is to be explained thus: the Department bases its calculations on the number of domestic animals, reckoning with a normal slaughtering of beasts of normal weight. Actually, the cattle were starving for lack of food and were often mostly skin and bone. Moreover, the farmers secretly slaughtered many small pigs for their own use. While this, of course, was illegal, the local authorities were unwilling to report their friends to the police. Consequently the farmers had enough bacon while very little was available for other people. Bacon was in fact rationed—120 grammes weekly for each person—and even this amount often could not be had. No more than 200 g. of beef was available at the normal price. If more was wanted, thrice the price had to be given. "Meat is so expensive," wrote a leading Copenhagen paper, "that common people cannot afford to eat it, even on Sundays." As this shortage of meat was on the verge of inducing revolt among labourers, the president of the Council for Nutrition reported to the Unemployment Committee that it was not possible to procure more than a third of the normal consumption of meat at the ordinary price.

Your readers may not find it easy to decide whom to believe; and I venture to remind them that my experiments on a cheap plain Chittenden-like diet were started forty years ago and aroused so much interest that the Government granted me a laboratory for nutrition. When the blockade threatened us in 1917 with starvation, I was appointed counsellor of the Government and issued a pamphlet advising the public to live on a diet consisting mainly of wholemeal rye bread mixed with wheat-bran, potatoes, barley porridge, milk, a little butter, and very little meat and vegetables. Of this pamphlet 40,000 copies were distributed and in 1918 I spent half my time travelling round the country giving instruction. In the discussions which followed my lectures I often heard housewives say: "That is all very well, but here we all live in accordance with your principles. We are compelled to do so." On these journeys I had ample opportunity to observe the underfeeding of cattle and its consequences. If anyone at that time had said that people were eating more meat than usual, the statement would have raised a laugh.

My own feelings on the low-protein diet are for me the best proof of its value. After living for forty years on this diet I do not feel old at 76. Last summer I travelled on cycle from one end of the country to the other, about 80 miles a day.

I am, Sir, yours faithfully,

Copenhagen, April 2nd. M. HINDHEDE.

HEARING-AIDS FOR DEAFNESS

To the Editor of THE LANCET

SIR,—I have read with great interest Dr. Dalton's letter in your issue of March 26th. It is always of real value to have the practical experience of a doctor describing the symptomatology and treatment of his own malady—and I most heartily agree with the advice he gives that no aurist should permit his patients to purchase a hearing-aid until the patient has fully tested it.

I would however go very much further than this and say that no patient should ever be sent to a vendor of hearing-aids unless an exact record of his hearing has first been obtained. The present state is chaotic. It is comparable with an ophthalmologist who refers a patient to an optician for glasses without making the slightest attempt to test the patient's refraction. Such procedure subjects the patient to the possibility of exploitation and is strongly to be deprecated. Though the time has not yet come, despite all that one reads, when a hearing-aid can be prescribed with the same accuracy as a pair of glasses, this does not excuse the aurist from making an exact calculation of the hearing loss both by air and bone conduction throughout the auditory range of from 200 to 10,000 vibrations. This result

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can only be expressed in a constant unit, and the yardstick of hearing is the decibel.

The aurist who fails to make use of the decibel measurement is like a fisherman describing with his hands the size of the fish that got away. The result of the examination of the patient's hearing should be charted in decibels, when it is possible by a glance at the graph to tell with scientific exactitude the type of aid best suited to the patient. Such a chart can tell you whether a carbon or crystal microphone will give the better definition and whether air or bone conduction should be used.

I am, Sir, yours faithfully,

EDWARD CAREW-SHAW.

Harley-street, W., March 29th.

ONCHOCERCIASIS

To the Editor of THE LANCET

SIR,—Reporting in your issue of March 5th on a case of onchocerciasis showing ocular complications diagnosed in this country, Dr. Adams refers to the possibility of the occurrence of similar cases in Europe. As a matter of fact, during the last six years such cases have been recorded in Germany, France, and Belgium, and now that attention has been focused on the matter it is very probable that in the future further cases will come to light.

Unfortunately treatment is far from satisfactory. The surgical removal or destruction of parent worms frequently fails to achieve its object, microfilariæ persisting, perhaps because of the presence of other adults, while the ocular damage remains unarrested; chemical attempts to destroy the worms or their embryos are also unsatisfactory, as we do not possess an efficient filaricidal drug.

Now opinions differ as to how much of the ocular damage is due to the mere mechanical presence of embryos in the eye, and how much is due to something in the nature of an allergic reaction associated with the presence of filarial products. As the results of orthodox treatment are uncertain and blindness is a serious condition, it seems, in view of the possibility of an allergic factor, worth considering whether the ordinary methods of treatment may not be supplemented with attempts at desensitisation by means of graduated doses of filarial antigen. This process, which was introduced by Dr. Fairley and is now being tested by us in the treatment of other filarial manifestations at the Hospital for Tropical Diseases, London, appears to be of considerable value. In the case of ocular onchocerciasis it would of course be necessary to proceed with the utmost caution lest any focal reaction precipitate the very condition it is wished to circumvent.

I am, Sir, yours faithfully,

Harley-street, W., April 5th. F. MURGATROYD.

"OUR COLLEAGUES IN AUSTRIA"

To the Editor of THE LANCET

SIR,—May I express my entire agreement with Mr. Aubrey Goodwin's letter in your last issue? A further accession to the British medical profession of medical refugees from Central Europe will have very serious consequences for practices here, and will undoubtedly result in undue competition. This being the case I am convinced that the bulk of the profession does not agree with the signatories of the letter under the heading "Our Colleagues in Austria" in your issue of March 26th. I suggest that a vote be taken of the whole medical profession in the British Isles on this question by some authoritative body.

I am, Sir, yours faithfully,

FREDERICK C. ENDEAN.

Queen Anne-street, W., April 2nd.

To the Editor of THE LANCET

SIR,—Jewish members of the medical profession must surely have been touched by the friendly and generous terms of the letter which was recently published in your columns over the signatures of many distinguished men, dealing with the tragic plight of our colleagues in Austria. Mr. Aubrey Goodwin's comments, however, show very clearly the difficulties that have to be overcome before goodwill can be converted into constructive help. Clearly no one has in mind admitting a large number of foreign doctors into this country, and I doubt, equally, whether anyone would advocate their complete and absolute exclusion without any regard to the merits of the individual case. The procedure which has been followed in the past may perhaps guide us in deciding on a fair and reasonable policy for the future.

Since March, 1933, a total of 187 German doctors have been permitted to settle and follow their profession in this country. To see the meaning of this concession in a balanced way one must bear in mind that there are over 50,000 names on the Medical Register. For the last few years the Home Office has only granted permits in exceptional circumstances when it was conclusively shown that the applicant's special knowledge and experience would be of benefit to the profession as a whole. May I venture to suggest that it would be reasonable to continue such a policy, because it provides full safeguards for the interests of the profession, while offering the possibility of permitting certain carefully chosen individuals to continue their work here to the advantage of medical science and for the relief of human suffering.

I am, Sir, yours faithfully,

SAMSON WRIGHT.

Golders Green-road, N.W., April 5th.

To the Editor of THE LANCET

SIR,—As there are probably many of your readers who would like to add their signatures to the letter on doctors in Austria which you published in your issue of March 26th, would you be good enough to insert the following notice?

Will any members of the medical profession who are in sympathy with and would like to sign the letter published on March 26th on the subject of refugees in Austria please send their names to the hon. secretary, Medical Peace Campaign, 39, Southgrove, London, N.6.

I am, Sir, yours faithfully,

April 3rd. MARY T. DAY.

TASMANIA AND IMMIGRANT DOCTORS.—The Tasmanian Parliament has passed a Bill amending the Medical Act in view of a possible influx of doctors from Germany. Fourteen applications from German medical men have so far been made. The amending Bill requires candidates for registration to be British subjects and to possess a qualification obtained after "a complete course of training and examination in the country where the qualification was issued, at a university, college, or other institution recognised for that purpose in that country," or/and to possess "such other qualification as may be prescribed."

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PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS

Housing in Scotland

In the House of Commons on March 29th Mr. WEDDERBURN, Under-Secretary of State for Scotland, moved that the draft of the Housing (Scotland) Acts (Continuation of Contributions) Order, 1938, be approved. This Order authorised the continuance of subsidies for slum clearance and decrowding at the present rate on houses completed after March 31st, 1938. The present rate for slum clearance subsidy in Scotland was on a per capita basis of £2 10*s*., and £2 15*s*. in the case of rural areas, and therefore varied with the size of the family, that for two persons being £5, and for six persons £15. The subsidy under the 1935 Act, however, was at a flat rate for each house built, and amounted to £6 15*s*. per house. The average amount of subsidy for both decrowding and slum clearance amounted to slightly under £11 per house. Mr. T. JOHNSTON said there had been in Scotland a progressive deterioration in the amount of subsidy given to the local authorities during the past two or three years, and what the Government were doing now was to perpetuate a position in Scotland which the local authorities almost unanimously declared to be an impossible one, and one in which they did not feel that they could develop a large-scale building programme. While the subsidy was stabilised the cost of building had risen by over 25 per cent. In Scotland they had a 50 per cent. higher maternal mortality-rate than in England, and overcrowding was six times worse in Scotland than in England. The poor-law relief figure in Scotland was 2½ times worse than in England. Almost one-third of the people of Scotland were living more than two to a room, and in the burghs there were 300,000 houses without a separate water-closet. While the Labour Party could not vote against this Order on the ground that they could not take the responsibility for discontinuing the subsidy they must emphatically protest against the Government permitting the profiteering in house building materials in Scotland and thus permitting a depreciation in the value of the subsidy. Mr. ELLIOT, Secretary of State for Scotland, said it was common knowledge that there was great disquietude in the House of Commons and in Scotland as to the housing situation. They had already large building programmes, but it was in execution that they fell short. They were not getting inferior grants in Scotland to those in England, but the question really was, why they could not make as good use of them in Scotland as south of the border. Local authorities should give attention to alternative methods of building, particularly to the timber house, as a possible source of relief. The number of houses being built and approved was still as high as it had ever been, even during the trough of low prices. That showed that the rise in cost had not discouraged local authorities from going on with houses. They must concentrate upon the most desperate problem—namely, the getting rid of the terrible dens and slums which existed. After that they would move on to other problems, but when there was only so much labour available they must in this case take the worst things first.

Sale of Contraceptives

On March 30th in the House of Commons Mr. R. J. RUSSELL introduced a Bill to regulate the public display in shops of contraceptives and matter descriptive thereof, to prohibit street trading in such articles, and to restrict their public advertisement. He emphasised the increasing development throughout the country, especially in the metropolitan area, of publicity with regard to contraceptives and their display and sale. By inquiry he had found that of 280 chemists' shops only seven did not stock and distribute contraceptives. In addition a large number of shops now dealt in contraceptives only, and in such a way as to be an offence to a large portion of the population. In one district alone there were 36 of these stores, apart from the chemists' shops. There was also a growing custom of buying these things through slot machines, and in factories and workshops touts were pushing these articles and information about their use. The country districts were also becoming infiltrated with the same thing. Under the terms of this Bill, if a dealer attempted to send these things or information about them to unmarried persons under 18 he would be guilty of an offence. But there was nothing in the Bill which would stop the sale of contraceptives to those who needed them, either by chemists or other stores conducted in a proper manner. Mr. THURTLE opposed the Bill partly on utilitarian grounds and partly because he believed that a private Member was not the right person to bring in such legislation. He did not know how extensive this evil might be, but if it was a real evil it ought to be dealt with by the Government Department concerned—namely, the Home Office. They had to remember that the practice of birth control in this country, whether they liked it or not, was very widespread, and while no one wished to see advertisements regarding birth control set out in an offensive manner, or contraceptive equipment exposed objectionably, they must recognise that this was lawful information for the men and women of the country, and Parliament ought not to make it unduly difficult for them to get that information and the necessary equipment.

Detention under the Mental Deficiency Act

After making full inquiry the Minister of Health has informed Mr. Logan that the action taken with respect to Mr. Hargreaves (see *Lancet*, April 2nd, p. 811) was the consequence of a mistake in the office of the Board of Control, which he deeply regrets. A sum of £200 has been accepted by Mr. Hargreaves in compensation for his distressing experience.

In the House of Lords on March 30th the Royal Assent was given to the Blind Persons Act, the Population (Statistics) Act, and the National Health Insurance (Amendment) Act.

In the House of Lords on April 5th, on the motion of Viscount GAGE, the following noble Lords were appointed to join with a committee of the House of Commons in the consideration of the Food and Drugs Bill: the Earl of Onslow, the Earl of Birkenhead, Lord Teynham, the Earl of Listowel, Lord O'Hagan, Lord Addington, and Lord Doverdale.

In the House of Commons on March 31st Sir Douglas Thomson introduced the Nursing Homes Registration (Scotland) Bill, which provides for the registration and inspection of nursing-homes in Scotland.

QUESTION TIME

WEDNESDAY, MARCH 30TH

H.M.S. *Caledonia*

Mr. GALLACHER asked the First Lord of the Admiralty whether he had any information concerning the outbreak of disease among boys on board H.M.S. *Caledonia*; how many cases had been reported of scarlet fever, middle-ear disease, and rheumatic fever; how many had been removed to shore hospitals with rheumatic hearts; and what steps were being taken to cope with this situation. —Mr. DUFF COOPER replied: The number of cases of scarlet fever and rheumatic fever that have occurred among boys in H.M.S. *Caledonia* since May 10th, 1937, when the first entries were made, are 74 and 31 respectively. The number of cases of middle-ear disease to Dec. 31st, 1937, was 20; since then there have been 30 cases of ear trouble but how many of these were middle-ear disease is not known. I am obtaining the

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information and will communicate it to the hon. Member. Seven boys suffering from rheumatism with heart complications have been sent to civil hospitals on shore. These numbers are not greater than are to be expected periodically in institutions of the type and size of H.M.S. *Caledonia*, and at the present time the amount of sickness there is declining. The position is being carefully watched and all the usual precautions to limit the spread of infectious disease are in force.

Mr. GALLACHER: In view of the very grave concern felt by the families of these lads—is the right hon. gentleman aware, for instance, that a mother gets a message that her boy has been sent home in an ambulance, and another writes to say that she is in a terrible state of distress because of the condition her boy has come home in—will he put an end to this *Caledonia* which is a death ship, and give the boys proper quarters on shore and proper diet?—Mr. DUFF COOPER: I can assure the hon. Member that the conditions on the *Caledonia* are extremely modern and up to date, and I shall be very pleased if he will take an opportunity to visit it for himself, when I am sure he will be very satisfied. I do not think that the amount of disease that has occurred among the 1000 boys and more would compare unfavourably with any similar institution in this country.

THURSDAY, MARCH 31ST

Hospitals Survey

Mr. ROBERT MORRISON asked the Minister of Health what was the purpose of the recent survey of voluntary hospitals carried out by his department; if the information was being collected as part of the air-raid precautions scheme; and whether it would be communicated to the local authorities.—Sir KINGSLEY WOOD replied: The survey, which is not limited to voluntary hospitals, has been undertaken with a view to making the fullest use of the existing hospital facilities, and extending them if necessary in a national emergency. The results of the survey will in due course be a matter for discussion with the local authorities.

Naval Medical Officers and Marriage Allowances

Sir JOHN ANDERSON asked the First Lord of the Admiralty whether he was yet in a position to announce any decision with regard to the extension of the privilege of marriage allowances to officers of the medical branch of the Royal Navy.—Mr. Shakespeare, Parliamentary Secretary to the Admiralty, replied: As I mentioned in the debate on the Estimates I was sorry the time had not permitted of a complete investigation of the application of marriage allowance to medical officers. It has now been decided that there is no reason for making any difference in the case of these officers, and it has just been announced to the Fleet that they will receive marriage allowances under the same conditions as other naval officers.

Non-stamping of Health Insurance Cards

Mr. DAY asked the Minister of Health whether he would give particulars of the number of persons who had been summoned during the three months ended to the last convenient date for failing to stamp the health insurance cards of their employees.—Sir KINGSLEY WOOD replied: The number of persons who were summoned during the period of three months ended Dec. 31st, 1937, for failing to stamp National Health Insurance contribution cards was 383.

Psychological Treatment of Prisoners

Sir RALPH GLYN asked the Home Secretary whether his attention had been drawn to a case at the Lewes assizes when, on March 15th, sentence was passed on two persons of 6 months' and 18 months' hard labour, respectively, in spite of the recommendation by counsel for the defence and medical testimony of the need for these persons to have psychological treatment; and whether, in view of this and other cases, he would consider the possibility of establishing, after consultation with eminent alienists, an institution on the lines of, although smaller than, Broadmoor where cases could be dealt with which were aggravated by prison treatment.—Sir SAMUEL HOARE replied: The psychological treatment of prisoners has been the subject of a special investigation by my medical advisers during the last few years and they hope shortly to present a report. When this report has been received I shall be in a better position to consider the general problem raised by the question of my hon. friend. It must, however, be remembered that the object of a sentence is not only to check the criminal propensity of the offender but to deter others from committing similar offences.

TUESDAY, APRIL 5TH

Health Insurance Benefits and Incurable Illnesses

Mr. PARKER asked the Minister of Health whether he proposed to use the national health insurance funds to give increased benefits to those disabled by incurable illness.—Mr. BERNAYS, Parliamentary Secretary to the Ministry of Health, replied: Provision is already made under the scheme of National Health Insurance for persons who were insured under the Acts at the time when they became disabled. Such persons, as soon as they have paid 104 weekly contributions, become entitled to disablement benefit up to the age of 65 and thereafter to an old age pension for the rest of life. Any approved society which has a disposable surplus on valuation may apply part of it to increasing the standard rate of disablement benefit, and societies covering a high percentage of the whole insured population have in fact done so.

DIVISION OF THE PRELIMINARY STATE EXAMINATION FOR NURSES

AT a meeting of the General Nursing Council for England and Wales held on March 25th, the following resolution was passed:—

"That the Council approve of the division of the preliminary State examination into two parts; Part I of the examination, which may be taken before entry to a training school, shall include the subjects of anatomy, physiology and hygiene. A candidate taking Part I of the examination before entrance to a training school will be required to produce evidence that she has undergone a course of instruction, approved by the General Nursing Council, which shall include the above subjects. The minimum age of entry to Part I of the examination shall be 18 years. The education and examination committee be requested to submit draft regulations for giving effect to this resolution."

The resolution was proposed by Miss H. Dey, matron of St. Bartholomew's Hospital, who accepted an amendment by Sir Frederick Menzies. A further resolution proposed by Miss E. MacManus, matron of Guy's Hospital, was also passed—that a statement that the Council approved of the division of the preliminary State examination should be included in the evidence to be given by the Council before the Interdepartmental Committee on Nursing on March 29th.

The division of the preliminary State examination was the subject of recommendations XL to XLIII of THE LANCET Commission on Nursing and was decided on by the General Nursing Council for Scotland in June, 1932.

FOOT-AND-MOUTH DISEASE.—Cattle with epizoötic aphthæ were, it seems, sent to Banbury market on March 24th and distributed thence over a wide area. This has led the Ministry of Agriculture to impose a standstill order over the greater part of England in order to give time to regain control of the position. New outbreaks were reported yesterday from places in Bedfordshire, Berkshire, and Wiltshire. The order prohibits the movement of cattle, sheep, pigs, and goats, except by licence, as well as the holding of markets except of fat-stock for immediate slaughter.

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MEDICAL NEWS

University of London

Lieut.-Colonel H. E. Shortt has been appointed to the university readership in medical parasitology tenable at the London School of Hygiene and Tropical Medicine.

Colonel Shortt, who is 50 years of age, was educated at the University of Aberdeen where he obtained the degree of M.B. in 1910. He entered the Indian Medical Service and was appointed to the central laboratory at Basra as protozoologist. During the late war he became assistant malaria officer and later chief malaria officer to the Mesopotamian Expeditionary Force, and he was afterwards appointed officer commanding the central laboratories at Basra and Baghdad. In 1922 he went to Assam as director of the Pasteur and Medical Research Institute at Shillong. In 1924 he joined the Kala-azar Commission as protozoologist and in 1926 succeeded Sir Rickard Christophers as director of that body, being responsible for the second report of the Commission issued in 1932. A year previously he had been made director of the Pasteur Institute of India at Kasauli, and in 1934 he took charge of the Central Research Institute there. Since 1934 he has been director of King Institute of Preventive Medicine at Madras. He was president of the medical and veterinary section of the Indian Science Congress when it met in 1936, and in the same year he obtained his M.D. degree and the diploma in tropical medicine and hygiene. Colonel Shortt has delivered lectures at university continuation courses and at the London School of Hygiene and Tropical Medicine, and has examined regularly for the M.D. degree of the University of Madras. He has published many papers on medical parasitology.

At recent examinations the following candidates were successful :—

D.M.R.

Part I.—E. P. Allen, Philip Beinart, J. W. D. Bull, A. G. S. Cooper, N. F. C. Hill, D. J. Hurrell, C. W. S. Jerram, B. Y. Mina, S. F. Oosthuizen, K. M. Rai, Philippa N. Vaus, and H. H. Winterstein-Gillespie.

University of Dublin

At recent examinations at the School of Physic, Trinity College, the following candidates were successful :—

M.D.

A. A. Lisney and C. J. de V. Shortt.

FINAL MEDICAL EXAMINATION FOR M.B., B.CH., B.A.O.

Therapeutics and Pathology.—Samuel Fine, L. E. Morris, and David Selman (with first-class honours); J. M. Dougan, J. D. Whiteside, H. D. Chomse, and B. S. Good (with second-class honours); R. R. Hogg, E. R. F. Mellon, J. R. C. Holmes, A. H. Isaacson, P. C. Denham, Arthur Graham, Kyrl T. Acton, Sheila Kenny, M. N. O'Riordan, W. B. Welply, T. H. Downes, and M. H. Waters.

Medicine.—H. J. R. Henderson, D. G. Harrison, T. W. Hanna, J. T. Speidel, R. A. Lutton, W. J. E. Pietersen, L. I. Warnock, Ronald Brass, L. N. Lynch, J. E. Murphy, and V. T. Williams.

Surgery.—J. C. M'Neilly, W. T. Kenny, and M. F. X. Slattery (with second-class honours); H. M. Buchanan, T. P. Griffin, B. W. Hughes, W. J. E. Pietersen, H. J. R. Henderson, Stella M. Coen, M. C. Warnock, and Thaddeus Fallon.

Midwifery.—T. L. Lawson, H. A. Dougan, and F. H. Counihan (with first-class honours); Robert Wilson, Brian Mayne, G. E. Nevill, J. C. de R. Sugars, and R. T. Burkitt (with second-class honours); W. W. McGrath, J. W. Boland, D. M. R. Barry, Miriam A. Becket, J. G. Waugh, E. W. R. Hackett, Deborah Bloom, Mary C. Conlin, H. R. T. Devlin, Muriel Elliott, F. D. F. Steede, W. C. Good, D. B. Taylor, S. L. Wray, R. S. M. Cooke, Emily E. E. Hill, J. W. Cathcart, W. A. J. Pike, G. D. Stevenson, T. W. Buckley, R. J. Grove-White, J. R. Murdock, D. A. Huggard, F. W. Parke, R. W. Temple, M. E. C. Balmer, D. B. George, J. L. Mans, and D. K. Stewart.

D.G.O.

M. S. El Kinany and Sarala Ghosh.

D.P.H.

Part I.—Eveleen M. H. Scott, Charlotte F. Pike, B. P. P. Berney, J. L. O'Neill, and Francis Keane.

D.P.M.

Part II.—D. T. Bardon.

National University of Ireland

At recent examinations at University College, Cork, the following candidates were successful :—

D.P.H.

V. J. Dillon (with first-class honours), J. G. O'Brien, T. P. P. O'Riordan (with second-class honours), and Helen P. Tracy.

A Double Anniversary

On April 2nd, at Kettner's Restaurant, Sir Henry Gauvain was entertained to dinner by the past and present resident medical officers of the Lord Mayor Treloar Cripples' Hospital and College, Alton, to commemorate the thirtieth anniversary of the hospital and Sir Henry's silver wedding. Dr. C. E. M. Jones, who has been resident at the hospital for 19 years, was in the chair.

Society of Apothecaries of London

At recent examinations the following candidates were successful :—

Surgery.—H. B. O. Cardew, Guy's Hosp.; A. P. Motley, Royal Colleges, Edin.; J. C. B. Nesfield, Camb. and St. Mary's Hosp.; and B. Oppenheim, Manch.

Medicine.—G. H. L. Bullmore, Univ. Coll. Hosp.; J. D. B. Perkins, Guy's Hosp.; and E. F. G. Stewart, St. Bart.'s Hosp.

Forensic Medicine.—G. H. L. Bullmore, Univ. Coll. Hosp.; L. L. Gottlieb, Frankfurt and Lond. Hosp.; J. D. B. Perkins, Guy's Hosp.; and E. F. G. Stewart, St. Bart.'s Hosp.

Midwifery.—P. C. Conran, Camb. and Middlesex Hosp.; E. L. Moll, Guy's Hosp.; E. S. Nicholson and T. E. Ooi, Oxford and Guy's Hosp.; and J. A. Taylor, Sheffield.

The following candidates, having completed the final examination, are granted the diploma of the society entitling them to practise medicine, surgery, and midwifery: G. H. L. Bullmore, L. L. Gottlieb, B. Oppenheim, and J. D. B. Perkins.

University of Aberdeen

At a graduation held on March 30th the hon. degree of LL.D. was conferred on Dr. Gunnar Dahlberg, director of the Institute of Medical Genetics at Upsala, Sweden. Diplomas in public health were also conferred on Mary E. Harrow and W. D. Wilson.

Fellowships in Psychiatry

Particulars will be found in our advertisement columns of three fellowships offered by the Child Guidance Council.

The fellowships, each of £300, are tenable for a year for half-time work at the London Child Guidance Clinic, 1, Canonbury-place, London, N. Applications should be sent to the secretary of the council, Woburn House, Upper Woburn-place, London, W.C.1, before May 10th.

Milk Pasteurisation

The Royal Sanitary Institute (90, Buckingham Palace-road, London, S.W.1) is giving a further course of lectures and demonstrations on pasteurisation, for medical officers of health, sanitary inspectors, and others interested, on May 26th and 27th.

Papworth Village Settlement

On May 14th, at 3 P.M., Dr. Walter Pagel will give a demonstration at the settlement on the allergic tissue reaction and the allergic disease. Medical practitioners who wish to attend are asked to let Dr. Pagel know in advance.

Royal Navy Medical Club

The twenty-fourth annual dinner of this club will be held at the Trocadero Restaurant, London, W., on Friday, April 22nd, at 8 P.M. Particulars can be had from the hon. secretary (Surgeon Commander M. B. Macleod, R.N.), Medical Department, Admiralty, London, S.W.1.

International Congress of Tropical Medicine and Malaria

The third International Congress of Tropical Medicine was to have met at Amsterdam in 1932, and the third International Malaria Congress at Madrid in 1935. Both had to be postponed. It is now proposed to hold a joint congress at Amsterdam from Sept. 24th to Oct. 1st under the presidency of Dr. G. Gryns. The programme for the section of tropical medicine includes deficiency diseases, filariasis, leptospirosis, yellow fever, and vaccination against plague; in the section of comparative tropical pathology measures against hydrophobia, rickettsia, and the extirpation of the tsetse fly will also be discussed. Prof. N. H. Swellengrebel will preside over the malaria congress when thirty workers are each giving a short address on a subject of their own choice. They will include Sir Rickard Christophers, F.R.S. (respiratory metabolism of *Plasmodium knowlesi*), Colonel S. P. James, F.R.S., and Prof. M. Ciuca (species and races of malaria parasites: experimental pathology and immunity), Lieut.-Colonel J. A. Sinton, F.R.S. (immunity in malaria), Sir Malcolm Watson (the prevention of malaria in Malaya, 1900–37), and Dr. D. Bagster Wilson (infection and immunity in some tribes of Tanganyika). Speakers in the other sections will include Sir Robert McCarrison, Dr. N. Hamilton Fairley, and Dr. G. M. Findlay. Further information may be had from the secretary of the congress Mauritskade, 57, Amsterdam, O.

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Congress of Medical History

The eleventh International Congress of Medical History will take place in Jugoslavia from Sept. 1st to 12th under the presidency of Prof. Thaller Lujo. Sessions will be held at Zagreb, Belgrade, Sarajevo, and Dubrovnik. Further information may be had from the secretary-general of the congress, Dr. Vladimir Bazala, Vlaska Ulica 95/1, Zagreb, Jugoslavia.

Glasgow University Club, London

This club will dine at the Trocadero Restaurant, London, W., on Friday, May 27th, at 7.30 P.M., when Prof. E. P. Cathcart, F.R.S., will be in the chair. Any Glasgow University men who, though not members of the club, wish to attend are asked to write to the hon. secretaries, 62, Harley House, London, N.W.1.

Royal Microscopical Society

A meeting of this society will be held at B.M.A. House, Tavistock-square, London, W.C., on Wednesday, April 20th, at 5.30 P.M., when Prof. R. Ruggles Gates, F.R.S., will read a paper on the structure of the chromosome. Dr. J. A. Murray, F.R.S., will communicate a paper for Dr. Miles Johnston on some methods of preparing fish otoliths for examination.

Ophthalmological Society of the United Kingdom

This society will hold its annual congress at the house of the Royal Society of Medicine, 1, Wimpole-street, London, W., from April 28th to 30th, under the presidency of Dr. Gordon Holmes, F.R.S. Apart from a discussion on the differential diagnosis of the causes of exophthalmos, the meeting will be devoted to personal communications. The secretary is Mr. L. H. Savin, 7, Queen-street, W.1.

Prize for Medical Jurisprudence

The next award of the Swiney prize which is decided by a joint committee of the Royal Society of Arts and the Royal College of Physicians will be made in January, 1939. The prize, which consists of a cup and the sum of £100, is offered alternately for the best published work in medical and general jurisprudence, and as the last award of the prize in 1934 went to Sir William Holdsworth for his work, "A History of English Law," this time it will be offered for medical jurisprudence. Applications should be sent to the secretary of the Royal Society of Arts, John-street, London, W.C.2, before Nov. 30th.

Medical Research in Canada

As announced in our issue of Feb. 26th, Sir Frederick Banting, F.R.S., director of the department of medical research at the University of Toronto, has been nominated by the National Research Council as chairman of a new committee to study the organisation of medical research in Canada. This action follows the recommendation of a conference attended by representatives of all the medical schools, organisations and institutions concerned in medical research. The committee will include as ex-officio officers the president of the National Research Council, the Deputy Minister of the Department of Pensions and National Health, the president of the Canadian Medical Association, and the president of the Royal College of Physicians and Surgeons of Canada, together with twelve members of the medical profession with specialised knowledge in a particular field and knowledge of Canada's requirements in medical research. It has been suggested that the formation of this committee under the National Research Council might well be a first step towards the formation of a medical research council for Canada similar to the one in Great Britain and it is understood that when a purely medical research council becomes necessary there will be no opposition, but all possible assistance, from the National Research Council. One of the first steps to be taken by the present committee will be to survey the work in progress at various centres so as to determine how it may be developed to the best advantage. It is felt that better dissemination of information will greatly enhance the opportunities of the research workers to make their efforts effective.

Importation of Meat

The importation into this country of all meat and meat products will henceforth be permitted only if they are accompanied by an official certificate recognised by the Minister of Health as evidence of satisfactory inspection and hygienic preparation. Besides the certificates already recognised for 31 countries, the Minister has now recognised official certificates for France, Kenya Colony, and South West Africa.

Royal Medical Benevolent Fund

At the annual general meeting of the Fund, held on April 5th, the accounts for 1937 were presented, from which it appears that 236 annuities amounting to £6248 were granted to aged and infirm persons, in addition to 431 annual allowances amounting to £12,120. The Fund also accepted responsibility for disposing of nearly £2000 on behalf of other societies in special grants for education and maintenance. During the twelvemonth the Ladies' Guild were in a position to make their own grants amounting to nearly £5000, not including the value (estimated at £1000) of clothing distributed during the year. A further £1000 was distributed by the Guild on behalf of other societies. It was decided, instead of printing a formal report this year, to send a personal letter to all the subscribers and donors explaining the objects of the Fund and its various activities. Sir Thomas Barlow was re-elected president, Dr. Lewis Glover hon. treasurer, and Mr. R. M. Handfield-Jones hon. secretary.

Insurance of Young Workers

From the beginning of this week workers between the ages of 14 and 16 become insurable under the National Health Insurance Acts for the purpose of receiving medical benefit. The rate of contribution is 4*d.* a week, of which 2*d.* is payable by the employer and 2*d.* by the worker, and the number of boys and girls immediately affected is about 1,000,000. These juvenile contributors are eligible to join approved societies and are advised to do so. The new entrants are each to receive a personal message from Sir Kingsley Wood as follows:—

"The medical card which is sent to you by the insurance committee with this letter enables you to choose a doctor. You should make your choice now, so that you will know to whom you may go for medical treatment and advice when you require it.

"What I, as Minister of Health, want to impress on you is that the future of our country largely depends on the health and fitness of you young men and women. You can play your part by doing all you can to keep fit and well. If you have occasion to go to the doctor, you should remember to act upon any advice which he gives you for the future. This may make all the difference to your health and happiness in after life."

A pamphlet about the scheme (memorandum 335X) may be had from any local office of the Ministry of Health, the Welsh Board of Health, or the Ministry of Labour.

Education of the Body

A course of 20 lectures on national fitness is being given at Olympia, and on Tuesday last Lord Dawson presided when Captain S. J. Parker, chief inspector of physical training of the Board of Education, gave an introductory address. "Just think for a moment of the daily existence of millions of our citizens," said Captain Parker. "Can you imagine anything further removed from the life of a healthy animal; anything which is less likely to produce an efficiently functioning and well-developed body? It is natural life seen in a distorting mirror. Comfort and speed—are they not becoming our greatest enemies? The logical conclusion of this line of development seems to me to be a palpitating brain carried on a mechanically-propelled litter." Both at work and in recreation, the speaker declared, we tended more and more to sedentary and indoor pursuits. It had become necessary to safeguard mental and physical health by means of wisely directed physical education. This should include not only gymnastics, games, swimming, and dancing but sports, walking-tours, camping, and all forms of recreation and exercises likely to inculcate a love of the open air and a healthy way of living. Physical education should build up physical efficiency, strength, and endurance. It should cultivate correct posture and it should develop neuro-muscular control.

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Medical Diary

April 11th to April 16th

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MONDAY.

United Services. 4.30 P.M., annual general meeting. Colonel E. M. Cowell: The Organisation of Medical Services in Air-raid Precautions.

TUESDAY.

General Meeting of Fellows. 5.30 P.M., ballot for election to the Fellowship.

Psychiatry. 8.30 P.M., Dr. W. S. Maclay (in collaboration with Dr. E. Guttmann and Dr. W. Mayer-Gross): Spontaneous Drawings ("Doodles") as an Approach to some Psychopathological Problems.

SOCIETY FOR THE STUDY OF INEBRIETY.

TUESDAY.—4 P.M. (11, Chandos-street, W.), annual meeting. Dr. Adolphe Abrahams: Alcohol, Tobacco, and Other Drugs in Relation to Physical Efficiency.

PADDINGTON MEDICAL SOCIETY.

TUESDAY.—9 P.M. (Paddington Town Hall, Harrow-road, W.), Mr. Douglas Macleod: The Conduct of Midwifery in General Practice.

SOUTH-WEST LONDON MEDICAL SOCIETY.

WEDNESDAY.—9 P.M. (Bolingbroke Hospital, Wandsworth-common, S.W.), clinical meeting.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

UNIVERSITY OF GLASGOW.

TUESDAY.—4.30 P.M. (Tennent Memorial Building, Church-street), Dr. J. Burdon-Cooper: The Non-surgical Treatment of Cataract.

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane-road, W.

MONDAY.—2.30 P.M., Sir Edmund Spriggs: Diseases of Small and Large Intestine.

WEDNESDAY.—Noon, clinical and pathological conference (medical). 3 P.M., clinical and pathological conference (surgical). 4.30 P.M., Dr. C. H. Andrewes: Recent Work on Viruses.

THURSDAY.—2.15 P.M., Dr. Duncan White: radiological conference. 3.30 P.M., Mr. L. Carnac Rivett: Benign Neoplasms of Uterus. 4.30 P.M., Mr. Kenneth Walker: Venereal Diseases.

Daily, 10 A.M. to 4 P.M., medical clinics, surgical clinics and operations, obstetrical and gynæcological clinics and operations.

NATIONAL HOSPITAL FOR DISEASES OF THE HEART, Westmoreland-street, W.

TUESDAY.—5.30 P.M., Dr. T. F. Cotton: Rheumatic Heart Disease in Children and its Treatment.

LEEDS GENERAL INFIRMARY.

TUESDAY.—3.30 P.M., Mr. George Armitage: Recent Developments in the Treatment of Prostatic Enlargement.

Vacancies

For further information refer to the advertisement columns

Accrington, Victoria Hosp.—H.S., £175.
Ashton-under-Lyne Lake Hosp. and Darnton House Institution.—Sen. Res. M.O., at rate of £250.
Bedford County Hosp.—H.S., at rate of £155.
Birkenhead, Clatterbridge (County) General Hosp.—Sen. Res. M.O., £350.
Blackburn, Queen's Park Hosp. and Institution.—Res. Jun. Asst. M.O., £200.
Blackburn Royal Infirmary.—Res. H.P., £175.
Board of Control, Northumberland-avenue, W.C.—Commissioner, £850.
Bolton Education Committee.—Asst. M.O.H. and Asst. School M.O., £500.
Bradford City.—Asst. City Pathologist, £500.
Brentford and Chiswick Borough.—Ophth. Surgeon, £2 12*s.* 6*d.* per session.
Brighton Education Committee.—Asst. School M.O., &c., £500.
Bristol City and County.—Asst. M.O.H., £500.
Bristol University.—Sen. Clin. Pathologist, £700–£800.
British Postgraduate Medical School, Ducane-road, W.—First Asst. in Dept. of Obstet. and Gyn., £250–£500.
Buxton, Devonshire Royal Hosp.—H.P., at rate of £150.
Canterbury, Kent and Canterbury Hosp.—Hon. Anæsthetist.
Capetown City.—Tuberculosis Officer, £800.
Cardiff, King Edward VII Welsh National Memorial Assoc.—Asst. Res. M.O. for North Wales Sanatorium, £200.
Central Middlesex County Hosp., Willesden, N.W.—Jun. Res. Asst. M.O., at rate of £250.
Chelmsford County Council.—Temp. Tuberculosis Officer, £15 per week.
Chester Royal Infirmary.—H.P., £150.
Chorley and District Hosp.—H.S., at rate of £150.
Coventry and Warwickshire Hosp.—Cas. O., H.P., two H.S.'s, and H.S. to Ophth. Dept., each at rate of £150.
Croydon County Borough.—Asst. M.O.H. and Asst. School M.O., £500.
Dartford, Bergman Osterberg College.—Lecturer in Physiology and Hygiene.
Derbyshire Royal Infirmary.—H.P., and H.S. for Ear, Throat, and Nose Dept., each £150.
Devonport, Prince of Wales's Hosp.—Jun. H.S., at rate of £120.
Dreadnought Hosp., Greenwich, S.E.—H.P., at rate of £110.
Dundee Royal Infirmary.—M.O. in Med. Elect. Dept., £1000.
Gravesend Borough.—Asst. M.O.H. and School M.O., £600.
Great Yarmouth General Hosp.—H.S., £140.
Herefordshire County Council.—Asst. County M.O. and M.O.H., £800.
Holborn, Metropolitan Borough.—Asst. M.O., £600.
Hosp. for Consumption and Diseases of the Chest, Brompton, S.W.—Res. Surg. O., at rate of £150. Asst. Res. M.O. and three H.P.'s, at rate of £150 and £50 respectively. Also Asst. Physician.
Hostel of St. Luke, 14, Fitzroy-square, W.—Res. M.O., at rate of £200.
Hull Corporation, Health Department.—Asst. M.O.H., £600.
Kent County.—Asst. Tuberculosis Officer, £600.
King Edward Memorial Hosp., Ealing, W.—H.S. to Spec. Depts.; at rate of £150. Also Cons. Physician and Second Cons. Laryngologist.
Leeds Public Dispensary and Hosp.—Cas. O., H.S., and H.P., each at rate of £150.
Leicester, County Sanatorium and Isolation Hosp., Markfield.—Jun. Res. M.O., at rate of £300.
Liverpool and District Hosp. for Diseases of the Heart, 34, Oxford-street.—H.P., at rate of £100.
Llanelly Borough.—Asst. M.O.H. and School M.O., £500.
London Chest Hosp., Victoria Park, E.—Surg. and Med. Regs., £225 and 175 respectively.
London Child Guidance Clinic, 1, Canonbury-place, Islington, N.—Three Fellowships in Psychiatry, each £300.
London County Council.—Part-time Cons. Pædiatrist, £125.
London Lock Hosp., 283, Harrow-road, W.—Res. M.O., at rate of £175.
Manchester, Christie Hosp. and Holt Radium Institute.—Asst. M.O. to Radium Institute, £400.
Manchester Hosp. for Consumption, &c.—Asst. M.O. for Crossley Sanatorium, £200.
Manchester Royal Infirmary.—M.O., to Out-patients, £105.
Metropolitan Hosp., Kingsland-road, E.—Sen. and Jun. H.P.'s and H.S.'s, each at rate of £100.
Middlesex County Council.—Asst. Dental Officer, £500.
Mount Vernon Hosp., Northwood.—H.S., at rate of £150.
Newport, Mon, Royal Gwent Hosp.—Res. Surg. O., £250. Also H.S. to Fracture and Orthopædic Dept. and Cas. O., each £135.
Northampton County Mental Hosp.—Deputy Med. Supt., £600.
Norwich, Norfolk and Norwich Hosp.—Cas. O., £120.
Pontefract General Infirmary.—Sen. Res. M.O., at rate of £175.
Preston and County of Lancaster Royal Infirmary.—H.S. to Eye, Ear, Nose, and Throat Dept., at rate of £150.
Queen Charlotte's Maternity Hosp., Marylebone-road, N.W.—Res. Anæsthetist, at rate of £100.
Queen Mary's Hosp. for the East End, Stratford, E.—Hon. Asst. Surgeon.
Richmond Royal Hosp., Surrey.—Jun. H.S., £100.
Rochdale Infirmary and Dispensary.—Second H.S., £150.
Rotherham Hosp.—H.P., £180.
Royal Cancer Hosp., Fulham-road, S.W.—Second Asst. Pathologist, £300.
Royal Chest Hosp., City-road, E.C.—Res. M.O., at rate of £150. H.P., at rate of £100. Also Clin. Asst.
Royal Naval Medical Service.—Medical Officers.
Royal Northern Hosp., Holloway, N.—Clin. Asst. to Ear, Nose, and Throat Dept.
Royal Waterloo Hosp. for Children and Women, Waterloo-road, S.E.—Res. Cas. and Orth. H.S., at rate of £150. H.P., at rate of £100. Also Hon. Surg. Reg.
Samaritan Free Hosp. for Women, Marylebone-road, N.W.—H.S., at rate of £100.
Sheffield, Jessop Hosp. for Women.—Res. M.O., at rate of £150.
Stepney Metropolitan Borough.—Tuberculosis Officer, &c., £750.
Stoke-on-Trent, Burslem, Haywood, and Tunstall War Memorial Hosp.—Res. H.S., at rate of £175.
Stoke-on-Trent, North Staffordshire Royal Infirmary.—Res. Anæsthetist, at rate of £150.
Surrey County Sanatorium, Milford, nr. Godalming.—First Asst. M.O., £570.
Torquay Borough.—Deputy M.O.H. and Asst. School M.O., £600.
Tunbridge Wells, Kent and Sussex Hosp.—H.S., £150.
University College Hosp. Medical School.—Beit Memorial Scholarships for Medical Research, £400.
University of London.—Chair of Anatomy, at London Hosp. Med. College, £1000.
West London Hosp., Hammersmith, W.—Additional Hon. Reg. to Throat, Nose, and Ear Dept.
Willesden General Hosp., Harlesden-road, N.W.—Hon. Clin. Asst. to Med. Out-patient Dept.
Winchester, Royal Hampshire County Hosp.—Two H.S.'s, each at rate of £100.
Windsor, King Edward VII Hosp.—Cas. O., £120.
Wolverhampton, New Cross Hosp.—Res. Asst. M.O., £200.
York County Hosp.—H.S. to Eye, Ear, Nose, and Throat Dept., £150.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Banff (Banff), Fareham (Hants), and Finedon (Northants).

Medical Referee (or Referees) under the Workmen's Compensation Act, 1925, for Neath and Port Talbot (Circuit No. 30); Aberayron; Cardigan; Carmarthen, Llandilo Fawr, and Ammanford; Lampeter; Llandovery; Llanelly; Newcastle-in-Emlyn (Circuit No. 31). Applications should be addressed to the Private Secretary, Home Office, Whitehall, London, S.W.1, before April 25th.

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NOTES, COMMENTS, AND ABSTRACTS

SUPPLY OF VITAMINS A AND C ON A NORWEGIAN HUNTING EXPEDITION DURING A WINTER IN GREENLAND

BY ARNE HØYGAARD
AND
HARALD WAAGE RASMUSSEN

THE data reported here are the outcome of some studies made on an expedition to Angmagssalik, East Greenland, in 1936–37. The chief purpose was to inquire into the physiology of Eskimos, and the results of these are reported elsewhere (Høygaard 1937). Here we propose to deal only with the examination of the crew from a Norwegian hunting vessel.

The ship came to Angmagssalik in August, 1937, after having wintered in Loch Fine, about 74° N.L. The crew of 12 men came straight to our laboratory from the ship as soon as it had anchored in the harbour. During the winter none of them had been ill; there were no records of scurvy or nervous disturbances. On the journey from Loch Fine to Angmagssalik the captain for a fortnight suffered from beri-beri.

EXAMINATION OF CREW

The crew was examined in the following way:—

1. *Clinically* in order to detect signs of avitaminoses, such as bleedings in the joints, œdema, or abnormalities of the skin. The cavity of the mouth was inspected by the dentist, Dr. P. O. Pedersen. The pulse-rate was noted, the blood pressure registered, and heart and lungs were examined.

2. *The ascorbic acid in the blood* was determined by the method of Emmerie and van Eekelen. The normal amount of ascorbic acid in human blood has not yet been accurately determined, but figures lower than 0·3 mg. per 100 c.cm. must certainly be regarded as indicating deficiency in vitamin C.

3. *Hemeralopia.*—This was estimated by the method recently described by Edmund and Clemmesen (1937) and to which Helga Frandsen (1935) also refers. It can generally be assumed that when the value for the power of distinction of the eye is less than 1·25 with Tscherning glass 4, some degree of hemeralopia is present. In many cases examined by this method we have ascertained that the power of distinction increases after intramuscular injection of vitamin A. In the cases referred to the men's vision was adapted to darkness for half an hour before the examination.

RESULTS

None of the men showed signs of scurvy. Slight inflammation of the gums was frequent, but according to the dentist this was due to bad hygienic conditions of the mouth. The captain suffered from definite beri-beri with much œdema in the lower extremities, but without any neurological symptoms. He was a little emaciated but he could walk about with some difficulty. Pulse-rate was 68, blood pressure 135/85. The pupils were equal and reacted normally to light and accommodation. The Romberg test was negative. The patellar reflexes were normal and no anæsthetic areas could be detected on the lower extremities. Heart and lungs seemed quite normal. He was treated with yeast and the symptoms disappeared in less than a week (see Table).

Rank.	Age.	Power of distinction.	Mg. per 100 c.cm. ascorbic acid in blood.
Captain	45	1·00	0·54
First mate	54	1·00 −	0·19
Second mate ..	45	1·00	0·23
Gunner	30	1·00	0·19
Engineer	70	1·00 −	0·15
Steward	35	1·25 −	0·15
Cook	45	1·25 −	0·23
Sailor and gunner ..	50	1·25 −	0·28
„ „ ..	25	1·00	1·24
„ „ ..	23	1·00	0·27
Dog driver	43	1·00 +	..
Fireman	35	1·00 −	0·20

(A plus sign indicates that the power of distinction is a little better than that shown by the figure; a minus sign indicates that it is worse than the figure indicates. The instrument was adjusted on two normal individuals who had a distinction power of 1·50 and 1·75.)

Foodstuffs used on the "Quest."—Meat of musk-ox, three to four times a week; salt fish, twice a week; salt meat, once a week; pickled herring, once a week; two pigs, one killed for Christmas and one in April, 1937; potatoes, finished in March, 1937; dried potatoes, from March, 1937; peas and beans, three times a week; porridge, frequently; bread, margarine, some cheese, treacles; cranberry jam, sometimes; coffee, tea, sugar; lemons, until Christmas, one slice for each man in the tea.

DISCUSSION

On looking at the list of the foodstuffs from the ship one would expect to find avitaminoses A and C. The only sources of vitamin A worth mentioning are the herring, the meat, and the cheese, but it seems almost certain that not enough was consumed to make the quantity ingested sufficient. The same can be said of vitamin C. Doubtless the whole crew suffered from hypovitaminosis A, nine of them suffered from hypovitaminosis C, and one of them, the captain, suffered from beri-beri. He sometimes used to take ascorbic acid tablets and that may explain the relatively high amount found in his blood. The extraordinarily high figure (1·24 mg. per 100 c.cm.) found in one of the gunners cannot easily be explained.

It is generally assumed that the beri-beri that used to be found in the crew of sailing vessels was a combination of several deficiencies. In the case of the captain there was no deficiency of vitamin C, and he was cured with yeast without giving vitamin A. We may then conclude that his beri-beri was caused by lack of vitamin B only.

It is evident that a ship on which the whole crew is suffering from hemeralopia will not be very efficiently navigated and that the hunting, which is the object of the expedition, will suffer also. An especial danger is likely to arise during night-sailing along coasts where the navigation depends on the power of distinction and the colour-perception of the eye, which is also affected in hemeralopia (Edmund 1927). Generally it can be said that the ability of a hunter depends upon the power of distinction of his eyes. Our experience among the Eskimos shows that the best Eskimo hunters possessed the best power of distinction, and Gjessing, an ophthalmologist who has great experience in examining gunners from Norwegian whalers, agrees that this is so. It may

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therefore be not only important but profitable to provide those on hunting expeditions with food rich in vitamin A.

The food on many merchant marine ships does not differ essentially from that supplied in our hunting vessels. It is thus probable that some of these ships are navigated by sailors suffering from hemeralopia, and here also it seems highly desirable to provide rations more rich in vitamin A.

SUMMARY

On a Norwegian hunting vessel wintering in the Arctic the crew of 12 men were examined for avitaminoses A and C, and an approximate list of the provisions on board was made. We found that the whole crew suffered from avitaminosis A and that 10 men suffered from hypovitaminosis C. The captain suffered from manifest beri-beri. We assume that these deficiencies may be present on whalers and merchant marine ships and diminish the efficiency of the crew both in hunting and in navigation by night.

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A SYMPOSIUM ON SILICOSIS

A COLLECTION of original papers on pneumoconiosis, contributed by well-known observers from various countries in Europe, is printed in the December issue of the Italian journal *Folia Medica*. Italy is one of the few great industrial countries in which silicosis is still not recognised for compensation; and these papers will serve to bring before Italian medical men the views, sometimes divergent, of various authorities on this complicated subject.

In an introductory paper Prof. Nicolo Castellino, director of the Institute of Industrial Medicine in Naples, refers to the Italian law of 1929, which provides compensation for certain industrial diseases as for accidents, and discusses the points for and against the recognition of silicosis as a compensatable industrial disease. The chief obstacle in the way of such recognition seems to be bound up with the difficulty in accepting silicosis as a definite entity. This is brought out in the paper contributed by Dr. C. Rist of the Paris Academy of Medicine, who admits the existence of silicosis as a distinct clinical syndrome but finds diagnosis impossible in the early stages. Dr. Rist discusses the obscurity of the pathology of silicosis—for example why continued exposure to siliceous dust determines silicosis in some operations and not in others; it is not certainly known even which are the dangerous forms of silica. The close association of silicosis and tuberculosis is imperfectly understood. Since tuberculous infection is the essential factor which makes possible the silicotic impregnation of the lungs, Dr. Rist suggests that the prophylaxis of silicosis should be based on three elementary principles: (1) protection of workers against the inhalation of mineral dusts; (2) medical examination of workers in dusty processes; and (3) preventive measures against tuberculosis. In a paper on the distribution of pneumoconiosis in Italy, Dr. P. C. Talini of Milan describes and illustrates the radiological characters of silicosis and mentions the industrial processes in which the disease is found in Italy; these present no distinctive features unknown in other countries.

Dr. L. Carozzi of Geneva quotes figures showing the heavy incidence of silicosis in those countries where the disease is recognised. He traces the development of theories of causation and the influence of various researches on modern views, and completes an instructive paper with a discussion on compensation. Dr. L. Teleky of Vienna writes on the scientific investigation of disease caused by dust. After referring to the action on the lungs of various kinds of dust he emphasises the care necessary in selecting the workers for examination, the value of the clinical examination, and the importance of technically satisfactory radiograms, and, finally, the desirability of determining the concentration and composition of the dust to which the workers are exposed. Dr. A. Feil of Paris, discussing the action of cement dust on the respiratory organs in the light of a study of 157 workers, of whom 40 per cent. had been in contact with cement for more than 10 years, concludes that cement dust does not predispose to tuberculosis or to pneumoconiosis. Dr. Koelsch of Munich, writing on researches into the action on the lungs of different kinds of dusts, describes the investigations which he has carried out during 25 years and distinguishes the specific and grave changes produced in the lung tissues by silica from the effects of all other dusts. The serious and characteristic changes in the lungs depend in his view upon the proportion of free silica in the dust. It alone causes true silicosis. Other conditions may influence the changes found in the radiogram, such as the concentration of dust; the nature of the work—e.g., involving deep respiration; individual factors, connected with the defensive forces in the respiratory passages and in the tissues; and, finally, technical preventive measures. The presence in the dust of substances with a basic reaction restrains the action of free silica. Dr. Koelsch does not agree with the theory of W. R. Jones that sericite can cause silicosis. His own practical observations have shown that dust rich in sericite has produced no silicotic changes.

Dr. A. H. Vossenaar, chief of the medical service of the coal-mines in Holland, considers that silicosis is not an object of special interest in these mines, though it has to be dealt with from time to time. All coal-miners have initial and periodical medical examinations; all the records of unemployment, sickness, and hospital treatment of the miners are kept in a central institute; and a close coöperation exists between the medical service and the institute. Comparative figures of time lost through sickness show only a negligible difference in favour of coal-miners compared with rock-miners. Dr. Vossenaar has compared notes with Prof. Reichmann and Dr. Di Biasi in the Ruhr coalfield, where the incidence of pulmonary disease is high amongst the rock-miners. The reason for this difference between the two coalfields remains obscure. Radiological examination of 500 rock workers from different parts of the coalfield gave results which were regarded as practically negative, and this opinion was supported by the experts in the Ruhr. There seems good reason to believe that the progressive form of pulmonary fibrosis is not being produced in the coal-mines of Holland. Attention is drawn to the high incidence of silicosis in the mines of Siegerland and to its absence in those of Oberlahn; the composition of the rocks is almost similar in the two districts. Dr. Vossenaar quotes descriptions from several sources and cites cases, with radiographic illustrations, of pulmonary disease simulating silicosis, to show the divergence of views on the ætiology of the disease and the difficulty of diagnosis.

In the last paper in this collection Prof. Jötten and Dr. Stoechel of the Westphalian University describe the results already published elsewhere of intravenous injection into rabbits of various kinds of dust; they succeeded in producing silicotic lesions by injection of quartz.

SCARLET FEVER IN THE UNITED STATES

Surgeon-General H. S. Cumming states that the incidence of scarlet fever in the United States keeps at a fairly high level from one year to another, being approximately 200 cases per 100,000 inhabitants (*Bull. Off. int. Hyg. publ.* 1937, **29**, 2527). The mortality on the other hand remains low—viz., 2 deaths per 100,000 with a fatality-rate of about

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1 per cent. Active immunisation with five doses of toxin as recommended by the Scarlet Fever Commission is not much employed. In Philadelphia, for example, with a population of more than 1,900,000, only 5528 Dick-positive children were immunised in the course of four years. The method is chiefly used for nurses before they reach their hospital stage and in orphan homes. The following causes, in Cumming's opinion, account for the scanty use of active immunisation: (1) the large number of injections required; (2) the severity of the reactions following one or more injections; and (3) the uncertainty of practitioners and public health authorities about the degree of protection conferred.

THE PROVINCE OF THE CHIROPODIST

A BOOK on the theory and practice of chiropody, published in 1935, was so well received that the author has been encouraged to improve and extend its subject matter.[1] In the preface to this second edition Mr. Sayle Creer pays tribute to Mr. Charlesworth's enthusiasm for his art and to hit endeavour to encourage in his students an honess outlook devoid of quackery. The publication of such a book as this, in which the scientific basis for all forms of treatment is kept before the student's mind, is in itself sufficient to arouse confidence in the attitude of the doctor to the chiropodist. It is mainly suspicion of the chiropodist's ignorance of the importance of the conditions he is treating that engenders distrust and prevents coöperation. The author here makes a clear distinction between the conditions that can be treated by his fellow practitioners and those which require surgery. His readers will appreciate the distinction when they have digested the carefully written chapters on anatomy and pathology. The chapters dealing with the major diseases of the foot properly precede those dealing with the ailments that lie rightly within the province of the chiropodist. These latter chapters are the product of a very practical mind and of wide experience, and are an invaluable guide to the practitioner. Mr. Charlesworth's book deserves a continued success.

CARDIOMEGALIA GLYCOGENICA CIRCUMSCRIPTA

DEPOSITION of glycogen in the myocardium is sometimes responsible for enlargement of the heart in infants, and a case of this kind is described by S. van Creveld and H. M. van der Linde (*Ned. Tijdschr. Geneesk.* 1937, **81**, 6000).

A boy aged 5 months was admitted to hospital with a five days' history of dyspnœa, cough, vomiting, anorexia, pallor, and sweating. There had been no fever, and the child had previously been quite healthy, though he had put on little weight during the last two months. He appeared very ill. The respirations were rapid and shallow and accompanied by working of the alæ nasi and inspiratory indrawing of the intercostal spaces. There was no cyanosis, but both ankles were slightly œdematous. The heart was greatly enlarged both to the right and to the left, with a soft systolic murmur best heard at the apex. The lungs appeared normal. The edge of the liver was palpable three finger-breadths below the costal margin. The urine contained a trace of albumin.

A tentative diagnosis of glycogenic cardiomegaly was made, based on the short duration of the symptoms and the absence of any obvious cause for the cardiac enlargement. The child's condition grew steadily worse, with cyanosis and increasing œdema, and death took place on the tenth day after admission. At autopsy, besides extreme hypertrophy of the heart, a patent foramen ovale was found, with expansion of the entire pulmonary arterial system. In the cardiac muscle a number of peculiar patches could be seen, with thickening of the overlying endocardium or epicardium. These, on microscopic examination, were found to consist of degenerated cardiac muscle with fibrotic infiltration; and on appropriate staining deposits of glycogen were detected in the degenerated muscle cells.

The authors point out that the cause of glycogenic cardiomegaly is at present unknown. They think their case lends support to the view that circulatory disturbances in the myocardium have something to do with it.

THE EPILEPTIC MOTOR-DRIVER

THE Norwegian government committee concerned with the problems of epilepsy has issued a memorandum on the epileptic motor-driver and motor-cyclist. The members of this committee are unanimous in thinking that epilepsy should be a definite disqualification for the driving of a public motor vehicle, whether it be an omnibus or taxi-cab. At present in Norway an epileptic must have had no attack for three years if he is to receive a licence to drive a car, but there are several cases on record of a recurrence of epileptic fits after a three-year interval without any. If, for example, an epileptic is kept systematically under phenobarbitone or bromide for three years during which he is free from fits there is a possibility that administration of the drugs will become less regular, or even be discontinued by a patient who imagines that the disease is cured. Under such conditions the fits are likely enough to recur, especially if sleep is limited or disturbed, alcohol is consumed, or work is hard and irregular. Freedom from fits for three years gives an assurance of permanency only when there is some definite guarantee that the favourable conditions of the past three years will be maintained. The following five conditions for the granting of a driving licence to an epileptic are accordingly laid down by the committee: (1) freedom from fits for at least three years; (2) an assurance that anti-epileptic medication will be continued systematically and undiminished under supervision; (3) absolute abstinence from alcohol; (4) examination and certification by a neurologist; and (5) continuous medical control either by a police surgeon or by a doctor who has to report to the chief of police. It is further pointed out in the memorandum that some similar step must be taken to control cycling by epileptics, for even the riding of a push bicycle by an epileptic may cause serious danger to himself and others.

Prof. G. Monrad Krohn, who is a member of the committee, adds a rider to its memorandum, pointing out that doctors should be explicitly exempted from the obligations of professional secrecy in relation to epileptics. But, while regulations should be drafted to this effect, they should not be so worded as to suggest that the medical adviser of an epileptic must make detective-like inquiries about his patient's motoring activities. Prof. Monrad Krohn also suggests that the chief medical officer of a district should, by the help of notifications, compile a list of epileptics which the police could consult. This suggestion implies that epilepsy would be added to the list of notifiable diseases.

PIRQUET CONTROL OF B C G VACCINATION

FOR several years the French B C G school held that no great importance need be attached to the control of B C G vaccination by tuberculin tests such as Pirquet's. According to this school, it was immaterial whether the person vaccinated with B C G did or did not become Pirquet-positive as a result of such vaccination. In Norway Dr. J. Heimbeck has for several years questioned the wisdom of this attitude, and in *Nordisk medicinsk Tidskrift* for Feb. 5th (p. 201) he relates how his opinion was formed.

During 1930, when Heimbech disregarded the evidence of tuberculin tests, he administered B C G to 43 nurses of whom as many as 10 shortly afterwards

[1] Chiropody: Theory and Practice. Second edition. By Franklin Charlesworth, F.B.A.Ch., Founder of the British Association of Chiropodists. London: The Actinic Press. 1938. Pp. 205. 15*s*.

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developed tuberculosis which in 1 case proved fatal. This catastrophe impressed on him the necessity for tuberculin-testing, by which alone he could make sure that the B C G he had given had really induced an allergic state in the person vaccinated. The wisdom of this precaution is shown by the following figures. In the ten-year period 1927–36 he administered B C G by injection to 501 nurses, of whom 45 had to be omitted from the subsequent analysis for want of Pirquet supervision or for other considerations. Of the remaining 456, 341 became Pirquet-positive soon after the B C G vaccination, and only 9 of these afterwards developed tuberculosis. There were also 18 whose Pirquet reaction was so slight as not to fulfil the necessary conditions for a positive reaction, and 3 of these 18 afterwards developed the disease. There remained 97 nurses who did not become Pirquet-positive in response to the vaccination, and among them no fewer than 20 became tuberculous. These figures are interpreted as showing that unless B C G vaccination has induced an allergic state (as indicated by a positive Pirquet reaction) the aim of the vaccination has not been achieved and it is necessary to repeat it.

With regard to the duration of a positive Pirquet reaction induced by B C G, Heimbeck now possesses data suggesting that though a positive Pirquet reaction may disappear within three months of vaccination, its average duration is a matter of years. Even so, however, it seems wisest to regard the allergic state induced by B C G as more or less transitory, and to look around for means likely to evoke a more permanent allergic state. This, in his opinion, can best be attained by infection with virulent tubercle bacilli. With several of his nurses this has happened accidentally, and the feeble Pirquet reaction induced by B C G has been followed by the strong Pirquet reaction induced by contact with open cases of tuberculosis. But though Heimbeck advocates exposure to such infection after a nurse has become Pirquet-positive in response to B C G vaccination, he recognises the importance of arriving at a permanent allergic state by means less fortuitous than accidental infection.

THE LANCET 100 YEARS AGO

April 7th, 1838, *p.* 57.

From a leading article.

LIFE is held to be as precious in England as in any country; but it is singular that while the deaths of individuals are beheld with great sensitiveness, a callous indifference should prevail where death occurs on a large scale. In the Army Estimates there are two columns,—in the one are entered the figures 109,027, the number of men required to be voted; in the other column the charge for these is entered. . . . Nothing can be conceived more vague or delusive than the estimates, viewed as a system of accounts, nevertheless the Secretary at War is called upon to give some account of the expenditure of the *money* in the right-hand column. Of the loss of *men* in the left-hand column he never gives any account. In voting 109,027 men to be distributed over various climates, the Legislature perhaps votes away 2000 lives every year. . . . The average force in the West Indies from 1816 to 1828, was 8293; the average deaths 1044 a year. Parliament voted 1044 lives annually, to be offered up to the demon of the West India climate, without ever asking the Secretary at War for an account of this part of his stewardship. When he asked for money some acute economist would inquire what he had done with the sums voted last year. When he asked for lives, no voice was raised. . . . If Parliament voted that 10 men should every year be drowned in the Thames, and the happiness of the country depended upon the sacrifice, this would excite endless horror. . . . Change the scene,—send 10,000 men safely down the Thames, and devote 1000 of them every year to certain death in the West Indies,—and no one asks how many have died, or whether 500 might not have been saved?

Appointments

BROWN, J. T., M.B. Glasg., D.P.H., Deputy Medical Officer of Health and School Medical Officer for Accrington.

FAWCETT, R. E. M., M.B. Lond., Resident Medical Officer at the Leicester General Hospital.

HOWKINS, JOHN, M.S., M.D. Lond., F.R.C.S. Eng., Assistant Physician-accoucheur and Demonstrator of Practical Midwifery, St. Bartholomew's Hospital.

LYLE, W. F., M.D. Belf., D.P.H., Medical Officer for Morecambe and Heysham.

PHILP, J. F., M.B., F.R.C.S. Edin., Resident Surgical Officer at Ancoats Hospital, Manchester.

PROTHEROE, T. S., M.R.C.S. Eng., Assistant Medical Superintendent at the Royal Sea-Bathing Hospital, Margate.

RAFTERY, J. D., B.Sc., D.Phil. Oxon., M.R.C.S. Eng., House Surgeon at the Hammersmith Hospital (British Post-graduate Medical School).

SALT, P. G., M.A. Camb., M.R.C.S. Eng., Hon. Dermatologist to the Kent and Canterbury Hospital.

SAVAGE, THOMAS, M.R.C.S. Eng., Assistant Resident Medical Officer at the City of London Maternity Hospital.

SQUIRES, H. C., M.D. Oxon., F.R.C.P. Lond., Consulting Physician to the Sudan Government.

TOMLINSON, A. M., M.B. Manch., Resident Medical Officer at the City of London Maternity Hospital.

WELSH, FAUSETT, M.B. Birm., F.R.C.S. Eng., Assistant Surgeon to the Birmingham United Hospital.

Certifying Surgeons under the Factory and Workshop Acts: Dr. A. BREMNER (Sheffield East, York, W.R.); Dr. B. A. ABBOTT (Rugeley, Stafford); Dr. MARJORIE S. BARTLETT (Saffron Walden, Essex); Dr. J. S. JEROME, M.C. (Cleobury Mortimer, Shropshire); Dr. K. J. A. GILLANDERS (Cromarty, Ross and Cromarty).

Medical Referee under the Workmen's Compensation Act, 1925: Dr. J. T. INGRAM of Leeds, for the Bradford, Keighley, Otley, Skipton, Dewsbury, Wakefield, Halifax, and Huddersfield County Court Districts (Circuit No. 12), with a view to his dealing in particular with dermatological cases.

Births, Marriages, and Deaths

BIRTHS

BELL.—On April 1st, at Bentinck-street, W., the wife of Mr. Arthur C. Bell, F.R.C.S.—a son.

BIGBY.—On April 2nd, at Southampton, the wife of Dr. W. L. M. Bigby—a daughter.

FAGGE.—On April 1st, at Nuffield House, Guy's Hospital, the wife of Dr. Charles Hilton Fagge, of Braintree—a son.

FOX.—On March 31st, at Greenhouse, Rotherfield, to Margaret and T. F. Fox—a son.

IRLAM.—On April 2nd, the wife of Dr. S. G. Irlam, of Plymouth—a daughter.

MALKIN.—On March 28th, at Nottingham, the wife of Mr. H. Jordan Malkin, F.R.C.S.E.—a daughter.

WALMSLEY FISHER.—On March 27th, at Edinburgh, the wife of Captain G. B. Walmsley Fisher, I.M.S.—a son.

WITTS.—On April 4th, at Devonshire-place, W., the wife of Prof. L. J. Witts—a son.

DEATHS

DENSHAM.—On March 28th, in Cape Town, Henry Bryan Densham, M.B., C.M. Edin., of Stockton-on-Tees, in his 75th year.

DINGWALL.—On April 3rd, at Hove, Archibald Dingwall, M.D. Aberd.

FOX.—On March 31st, at Hill Cliff, near Warrington, Edward Joseph Fox, F.R.C.S. Eng., aged 65.

GENT.—On April 1st, at Southbourne, William Conway Gent, L.R.C.P. Edin., aged 76.

GODDING.—On March 31st, at Worthing, James Godding, O.B.E., Col. T.F., T.D., M.R.C.S. Eng.

MORRIS.—On April 3rd, John Morris, M.B. Oxon., of Watlington, in his 38th year.

REDDING.—On April 4th, at Ladbroke-grove, W.11, J. H. Douglas Redding, L.R.C.P. Edin.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

POST-GRADUATE COURSES IN GERMANY.—The German authorities for post-graduate medical instruction have arranged for international courses in the specialties to be held during the summer at various centres. The courses will all be given in German. Further information may be had from Aerztliches Fortbildungswesen, Robert Koch-Platz 7, Berlin, N.W.7.

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ADDRESSES AND ORIGINAL ARTICLES

SOME DEFICIENCIES OF NUTRITION AND THEIR RELATION TO DISEASE *

BY CHARLES C. UNGLEY, M.D. Durh., F.R.C.P. Lond.

ASSISTANT PHYSICIAN, ROYAL VICTORIA INFIRMARY, NEWCASTLE-UPON-TYNE; LEVERHULME RESEARCH SCHOLAR, ROYAL COLLEGE OF PHYSICIANS OF LONDON

I—ORIGIN AND DETECTION OF NUTRITIONAL DEFICIENCIES

As long ago as 1880 Samuel Fenwick observed the atrophy of the stomach in pernicious anæmia and appreciated the fact that an abnormal state of the gastro-intestinal tract might give rise to nutritional deficiency irrespective of the adequacy of the diet. It has remained for Castle, nearly fifty years later, to prove by experiment the theory of "conditioned" deficiencies in nutrition. It is now realised that in temperate climates diseases of deficient nutrition are more frequently caused by gastro-intestinal disturbances affecting the assimilation of food than by inadequate diets (Strauss 1934).

Causes of Nutritional Deficiencies

I shall consider causes under the following headings: factors adversely affecting food intake; factors leading to impairment of digestion and absorption; deficiencies of essential food elements conditioned by the composition of the rest of the diet; factors increasing the demands for nutrient elements or the rate at which they are katabolised; and other factors.

FACTORS ADVERSELY AFFECTING FOOD INTAKE

I do not need to stress the rôle of poverty, ignorance in the selection and cooking of foods, and the excessive use of refined, sterilised, canned, or otherwise commercialised products. "The best fed members of the population to-day, while getting twice as much vitamin B_1 as people on a low income level, yet consume less vitamin B_1 than the parish poor of the eighteenth and early nineteenth century" (Baker, Wright, and Drummond 1937).

Individuals living under isolated conditions, particularly men "left to the mercy of their own culinary incompetence," are liable to eat peculiar diets. I have encountered 3 cases of scurvy, aptly called by Meulengracht "bachelor scurvy," in men doing their own housekeeping. Xerophthalmia occurred in a young Indian canvasser, one of a group of coloured men living in a single room cooking (and currying) their own food. Idiopathic hypochromic anæmia, unusual in the male, was observed in an unmarried miner whose chief meal of the day consisted in oatmeal and milk. An epileptic youth who lived almost entirely on white bread and butter and tea developed a severe anæmia which responded to liver extract.

Food fads and fancies are sometimes a cause of deficient nutrition. Beri-beri in a vegetarian, and in a negro woman who ate large quantities of raw starch for its alleged cosmetic value, are amongst the reported examples (Brauchle 1933 and Kepler 1925). A young woman developed wet beri-beri after living on a meagre diet to check her obesity (Riesman and Davidson 1934).

Prescribed diets for ulcer, colitis, nephritis, hypertension, and diabetes sometimes lead to avitaminosis. A diabetic woman, on a very restricted diet, developed a beriberi-like state and a condition resembling xerophthalmia (Wohl 1926). A seaman because of ulcer symptoms restricted his diet to rice and developed beri-beri (see Lect. III). Rigid dieting for gastric ulcer may lead to scurvy (Martin 1931 and Barling 1935); lesser degrees of hypovitaminosis C are not infrequent (see Ingalls and Warren 1937). Meulengracht and Rothe Meyer (1937) described 4 cases of osteomalacia of the spinal column in one of which the deficient diet had been prescribed for dyspepsia and vigorously adhered to for five years.

Amongst other causes of inadequate food intake may be mentioned loss of appetite, nausea, sore mouth, imperfect teeth, dysphagia, pain in relation to food, and psychological disturbances.

FACTORS LEADING TO IMPAIRMENT OF DIGESTION AND ABSORPTION

When pellagra or beri-beri occurs in temperate climates the cause is usually alcohol addiction, or some disease of the alimentary tract. The rôle of alcohol is not a primary one in these conditions (see Lect. III).

Deficiency of digestive juices is important in the anæmias (see Lect. II). Achylia is often associated with increased capillary fragility which may fail to respond to vitamin C unless the latter is given parenterally (Schultzer 1935). Deficient absorption due to achlorhydria is believed to accentuate the B_1-avitaminosis sometimes encountered in chronic alcoholism, pregnancy, and gastro-intestinal disorders. Lack of pancreatic juice or of bile impairs the assimilation of fats and fat-soluble vitamins.

Gross anatomical lesions like peptic ulcer and carcinoma may lead to deficiency states because pain, vomiting, or anorexia limits food intake. But associated disorders of motility, digestion, and absorption also contribute by impairing the assimilation of food.

Pellagra secondary to diseases of the gastro-intestinal tract has often been described (see Strauss 1934, Simpson 1935, and Yudkin, Hawksley, and Drummond 1938). In many instances the diet had been entirely adequate for the prevention of pellagra in an individual with a normal alimentary tract. Other complications of gastro-intestinal disorders include beri-beri (see Lect. III), nutritional œdema, tetany, and occasionally scurvy.

In cœliac disease, non-tropical sprue, and other forms of idiopathic steatorrhœa, along with failure to retain ingested fat, there may be imperfect absorption of other nutrient factors. For example, 5 cases of idiopathic steatorrhœa recently investigated showed evidence of deficient absorption of calcium such as osteoporosis, osteomalacia, late rickets, and tetany, and other signs of deficiency such as nutritional œdema, nyctalo-hemeralopia, atrophic tongue, and anæmia. Sprue-like diarrhœa with other evidences of deficient absorption may result from obstruction of the lacteals by tuberculosis (Ryle 1924) or lymphadenoma (Fairley and Mackie 1937), or from tumour plaques on the intestinal wall (Lundsteen 1937).

Psychological factors influence not only the quantity and quality of food eaten but also its assimilation. The motor and secretory functions of the gastro-intestinal tract are affected by pain, fear, and anxiety (see Ivy 1934).

* The Goulstonian lectures for 1938, delivered before the Royal College of Physicians of London on March 3rd, 8th, and 10th. Lects. II and III will appear in later issues.

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DEFICIENCIES OF ESSENTIAL FOOD FACTORS CONDITIONED BY THE COMPOSITION OF THE REST OF THE DIET

The adequacy of a diet in respect to a single component thereof is to some extent dependent on the nature of the other constituents. Vitamin B_1 plays a part in the metabolism of carbohydrate, which in the absence of the vitamin may be halted at the stage of pyruvic acid (Peters 1936). Given a fixed (low) intake of vitamin B_1 per unit of body-weight, signs of deficiency will appear more rapidly the higher the total calorie intake. Thus in chronic alcoholism a high intake of calories as alcohol may accentuate the results of low intake of vitamin B_1.

The administration of drugs may interfere with nutrition. The alkalis given in the treatment of peptic ulcer appear to hinder the absorption of iron (Kellogg and Mettier 1936). Feeding large doses of iron to rats may so impair phosphorus absorption that rickets is the result (Brock and Diamond 1934).

FACTORS WHICH INCREASE THE DEMANDS FOR NUTRIENT ELEMENTS OR THE RATE AT WHICH THEY ARE KATABOLISED

Vitamins take an intimate part in cell metabolism, and anything which increases the metabolic rate may lead to an increased katabolism or "using up" of these substances. This relationship has been well demonstrated in the case of vitamin B_1 by Cowgill (1934) but probably applies to most of the vitamins. The rate of metabolism is increased by hard muscular work, fever, pregnancy, and certain endocrine disorders such as hyperthyroidism.

Hard muscular work is often a factor in the causation of pellagra (Ellinger, Hassan, and Taha 1937) and of beri-beri. Some pellagra cases improve spontaneously as soon as they are put to bed, even on a "pellagra producing" diet. "Bachelor scurvy" may improve under conditions of rest in hospital even although a diet deficient in vitamin C is given and the ascorbic acid content of the serum remains low (see Fig. 6). Men suffering from xerophthalmia and night-blindness have been known to improve on ceasing employment only to relapse once more when they start work (Spence, personal communication). An Indian with xerophthalmia and nyctalo-hemeralopia showed rapid improvement in his power of distinction when kept at rest in hospital on a diet low in vitamin A (see Fig. 3). The nutritional importance of sufficiently long hours of rest and sleep is probably partly dependent on the diminution of katabolic activities at these times.

Infections can give rise to nutritional deficiency by impairing the appetite and the assimilation of food, but important factors are the rise of metabolic rate and the wasting of tissues which accompany fever. Infection is often the exciting factor which renders manifest a long-existing latent vitamin deficiency—e.g., in beri-beri and in infantile scurvy.

Nutritional deficiencies often make their first appearance during *pregnancy*—e.g., deficiency anæmias, osteomalacia, and beri-beri. Pregnancy is associated with a 20 per cent. increase in basal metabolic rate. In addition, the demands of the fœtus for essential food factors are often supplied at the expense of the mother. Intractable vomiting sometimes plays a part. Edmund and Clemmesen (1937) found nyctalo-hemeralopia in a considerable proportion of 68 pregnant women admitted to their department.

Rapid *growth* is associated with increased metabolism and increased requirement for essential food factors. Infants of small birth-weight rapidly use up their stores of iron and tend to develop anæmia. The requirement for certain minerals and vitamins per kg. of body-weight is much greater in the child than in the adult.

Hyperthyroidism leads to increased metabolism, but because the appetite is usually excellent outspoken nutritional deficiencies are not common. I have recently seen an unmarried postwoman, aged 53, known to have had exophthalmic goitre for at least 15 years, who now presents a clinical picture resembling osteomalacia, with bones which bend or break on slight provocation.

OTHER FACTORS IN THE ÆTIOLOGY OF DEFICIENCIES OF NUTRITION

Loss of nutrient elements occurs at parturition and menstruation, during lactation, and as a result of bleeding from any cause. Excessive excretion of vitamins, hæmopoietic factors, or other nutrient materials possibly takes place under certain circumstances. A low renal threshold might conceivably predispose to depletion of the bodily reserves of vitamin C (see later). Vogt-Møller (1936) has described a case of diabetes insipidus complicated by slight symptoms of pellagra.

Defective storage or imperfect utilisation of vitamin A has been postulated as the cause of keratomalacia associated with liver disease (see Owen and Hennessey 1932).

Individual variations in susceptibility to dietary deficiency have been observed both clinically and experimentally. They may be *hereditary:* in areas where pellagra is endemic, many cases occur in certain families whereas other families on the same diet escape entirely. The inheritance of a tendency to achlorhydria is also important. Deficiency diseases such as beri-beri, rickets, and "subclinical scurvy" may appear in early infancy as the result of deficiency in the mother. Observations in rats by French and Bloomfield (1937) suggest that *previous deficiency* may leave an individual more susceptible to a recurrence of the deficiency.

Some Effects of Deprivation of Nutrient Substances

Of particular significance is the effect of deficient nutrition on the functions of the alimentary tract; when vitamin deficiency causes anorexia, achlorhydria, or other gastro-intestinal disturbances, these may then lead to deficient intake and impaired assimilation of essential food factors, so that a vicious circle is set up. According to Hellström and others (1937) persons living on a "milk-meal" diet deficient in meat, green vegetables, and fruit, show a higher incidence of digestive troubles and of achlorhydria than persons taking a more varied dietary.

It is by no means certain that the ulcers produced by dietary deficiency in animals have any relation to peptic ulcer in man. There is little published evidence that diets of high vitamin content yield clinical results in ulcer cases. Vitamin-C deficiency is not an ætiological factor (Schultzer 1934).

Nutritional deficiency has important effects upon intestinal function: diarrhœa is a common complication, for example, in beri-beri and in pellagra. A condition resembling sprue has been produced by feeding dogs on a diet deficient in vitamin B_2 (Miller and Rhoads 1933). The injection of crude liver extracts is said to diminish the rate of passage of the intestinal contents in tropical sprue (Mackie, Miller, and Rhoads 1935). Vitamin-B_1 deficiency is possibly an occasional cause of gastro-intestinal hypotonia (Vorhaus, Williams, and Waterman 1935), while ulcerative colitis may sometimes be the result

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of dietary deficiency (McCarrison 1920, Tilden and Miller 1930, Mackie and Chitre 1928, Larimore 1928).

Cardiovascular system.—The most important effects of deficient nutrition on the cardiovascular system are found in association with vitamin-B_1 deficiency. The clinical symptoms and signs, the blood chemistry, the myocardial changes, the hæmodynamics, and therapeutic responses correspond to those described in "beri-beri heart" in the orient. The disease as observed in temperate climates, however, is characterised by more varied and more generalised involvement of the cardiovascular system (Weiss and Wilkins 1937a and b). A causative relationship between vitamin-C deficiency and rheumatic fever probably does not exist (see Parsons 1938, Schultz 1936).

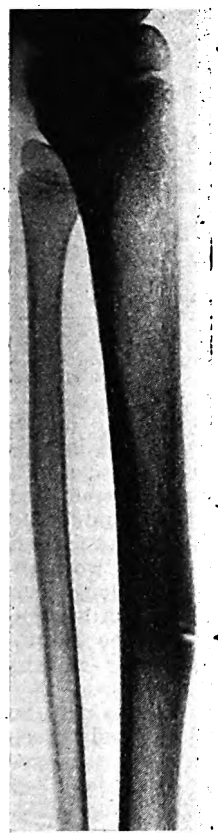

FIG. 1.—Looser's zone of metaplasia in the tibia.

Respiratory system.—Vitamin-A deficiency is attended by metaplasia of the epithelium of alveoli and terminal bronchi, one result of which is that the lung is less resistant to infections. The incidence of bronchitis and pneumonia is higher in children of poor families than in the better nourished offspring of the professional classes (Spence and Charles 1934). Hoarseness and aphonia are frequent symptoms in beri-beri and occurred in a case to be described later, in which polyneuritis and B_1-avitaminosis followed faulty gastro-enterostomy. The same patient also suffered from a peculiar type of "silent broncho-pneumonia," which may or may not have been related to the deficiency state; the radiographic changes simulated acute pulmonary tuberculosis but disappeared completely in a few weeks.

Urinary tract.—Vitamin-A deficiency in rats is commonly associated with urinary calculi: the causative factors appear to be keratinisation of the urinary epithelium, infection, and the change to alkaline urine. The stones disappear when the diet is corrected. Vermooten (1937) has recently reviewed the relation of diet to calculi in man and pointed out that the South African negro who lives on a diet rich in vitamin A and extremely low in calcium does not form calculi.

Tetany and *skeletal changes* such as rickets, osteoporosis, and osteomalacia are especially liable to occur in idiopathic steatorrhœa and other types of chronic diarrhœa; in some forms of nephritis (renal rickets); in persons on a diet low in vitamin D or mineral salts, especially if deprived of sunlight; and in certain endocrine disorders such as hyperthyroidism. Osteoporosis is also seen in scurvy. I have reported elsewhere the case of a woman of 54 who suffered from osteoporosis and brittle bones combined with a clinical picture resembling pernicious anæmia (Ungley and James 1934).

The significance of Looser's metaplastic zones is uncertain, but it has been suggested that they are nutritional in origin. I have 3 cases of this kind under observation at the present time: a man 53 years of age with an old gastro-enterostomy, hypochromic anæmia, and mild nervous manifestations; a woman aged 70 who also had osteo-arthritis of hip; and a boy of 12 with mild hypochromic anæmia. In the first two cases the lesion was in both femora, and in the third patient one tibia was affected (Fig. 1). Blood calcium and phosphorus values were invariably normal. The blood phosphatase values were 19·2, 6·6, and 17·7 units respectively. Both adults had complete histamine-refractory achlorhydria, and the boy had low acidity. Schopfer's test for vitamin B_1 gave a normal value in the man and a low value (6 μg. per 100 c.cm.) in the woman. In two cases there have been signs of healing under the influence of calcium and vitamin D.

Infection.—Extreme depletion of vitamin A leads to metaplasia of epithelial tissues and lowers their resistance to invading organisms. It has not yet been definitely proved, however, that subclinical forms of vitamin-A deficiency play a considerable part in the susceptibility to infection.

Detection of Nutritional Deficiencies

The clinical features of the classical deficiency diseases are well known, but in this country are rarely encountered. On the other hand less severe deprivation of vitamins, although widespread and of great importance in disease, is difficult to detect.

Attempts should be made to elicit details of the *diet* (*a*) before and (*b*) during the present illness. The former is important from the point of view of the cause of the illness, the latter for the interpretation of the significance of any deficiencies discovered. Because a diseased person showed vitamin deficiencies, it does not follow that the disease is the result of the deficiencies: the converse may be the case.

Certain points in the physical examination are useful in assessing the state of nutrition: the weight, height, and general condition of the patient; the texture of the hair, the tone of the muscles, and the lustre of the eyes; the colour of the palms of the hands and the mucous membranes; the texture of the skin and the presence or absence of pigmentation, hyperkeratinisation, petechiæ, &c.; the nails, whether brittle or spoon-shaped; the state of the teeth and the gums; and the presence or absence of atrophy of the papillæ of the tongue, or sores at the angles of the mouth.

Observations on nail-growth by a technique recommended by Prof. Le Gros Clark (personal communication) have yielded information of interest, but their value in routine nutritional studies has yet to be assessed. The possible utility of estimating the cystein content of nail-clippings (Sullivan, Howard, and Hess 1937) needs further investigation.

DETECTION OF DEFECTS IN DIGESTION AND ABSORPTION

In some cases we have used continuous aspiration with the double tube of Agren and Lagerlöf (1936), with the object of performing quantitative estimations on uncontaminated gastric juice. By this method one can also study the secretory activity of the pancreas in response to secretin (Agren, Lagerlöf, and Berglund 1936) and, if desired, the function of the gall-bladder. To determine the presence of Castle's intrinsic factor by biological assay is a lengthy process, and the value of chemical procedures for this purpose is uncertain.

A careful radiological examination is essential in studying the functions of the stomach and intestine, especially with regard to motility.

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Useful tests for intestinal absorption include: macroscopic and microscopic examination of the stools and fat analysis; comparison of the oral glucose-tolerance curve with an intravenous one (Ross 1936a, b, and c); time of appearance of iodine in saliva after giving potassium iodide (see Heath and Fullerton 1935); and the rate of excretion of sugars such as galactose or xylose after oral administration (Singer and Wechsler 1934, Helmer and Fouts 1937).

Intubation of the small intestine provides a more direct method of measuring absorption and may prove to be of great value in studying intestinal function in relation to deficiency states (Abbott and Miller 1936, Owles 1937, Groen 1937, Groen and Taylor 1937).

Vitamin A.—In the dietary history special attention should be paid to the intake of food rich in vitamin A and carotene. Examination should be made for morbid processes which might interfere with the use of fats, such as diseases of the biliary system and pancreas, vomiting, or diarrhœa.

Visual dysadaptation (nyctalo-hemeralopia) is the earliest manifestation of vitamin-A deficiency: vitamin A is necessary for the regeneration of visual purple after it has been bleached by light. Children may be observed to stumble into objects when playing at dusk. Adults find difficulty in driving at night and accidents have resulted from slowness of visual adaptation following exposure to the dazzle of approaching headlights. Some patients complain of "eyestrain," blurring of vision, or specks in front of the eyes, especially when reading by artificial light.

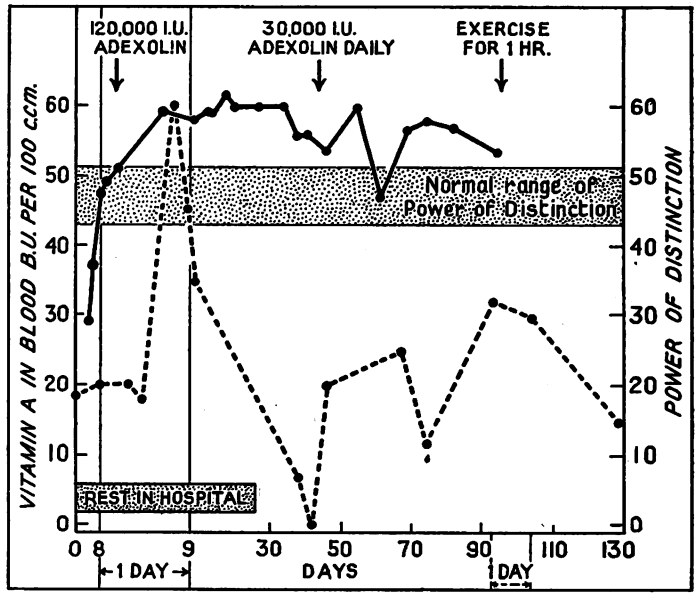
120,000 I.U. ADEXOLIN
30,000 I.U. ADEXOLIN DAILY
EXERCISE FOR 1 HR.
Normal range of Power of Distinction
REST IN HOSPITAL
VITAMIN A IN BLOOD B.U. PER 100 c.cm.
POWER OF DISTINCTION
0 8 9 30 50 70 90 110 130
1 DAY
DAYS
1 DAY

FIG. 3.—The results of tests for visual dysadaptation (nyctalo-hemeralopia) and for vitamin A in the blood in a case of xerophthalmia. Rapid improvement in the power of distinction occurred with rest in bed before vitamin A was given.

Xerophthalmia is now rarely encountered in this country, although a number of children and adults in the North of England were affected during a prolonged coal strike in 1926 (Spence 1931). The only case we have encountered recently was in an Indian canvasser aged 24. The disease commenced two years previously in India, and he had never for long been free from the symptoms. Visual adaptation became normal within a few days (Fig. 3) but the Bitot's spots persisted even after months of treatment.

Lesser degrees of xerosis may be recognisable as dull or cloudy areas on the conjunctiva after the eyes have been held open for 3–5 minutes (Sweet and K'ang 1935). Stained smears from the bulbar conjunctiva examined microscopically may show keratinisation of the epithelial cells.

Some cases of vitamin-A deficiency are accompanied by a characteristic follicular hyperkeratosis called by Nicholls (1933) phrynoderma (toad-skin). The dry atrophic state of the dermis may give rise to the appearance known as "giraffe-skin" (Wright, quoted by Rao 1937). I have seen both toad-skin and giraffe-skin in a man with scurvy, whose visual adaptation was poor.

Spence (personal communication) has observed that the healing of an artificially produced skin lesion (burn) is much slower than normal in persons deficient in vitamin A. The urine often contains excess of epithelial cells or even pus.

Marked dysadaptation is often found even in the absence of symptoms. We have used the technique of Edmund and Clemmesen (1936) as modified by Mutch

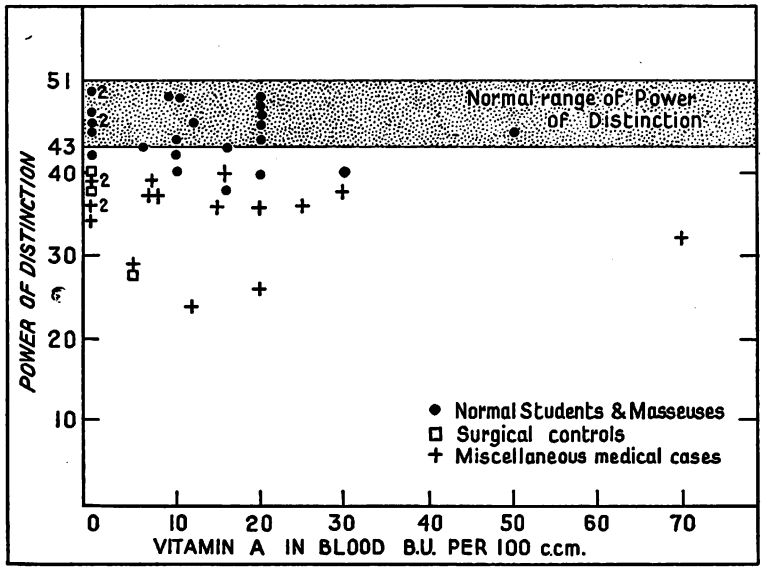

FIG. 2.—It will be noted that normal students and masseuses mostly showed a power of distinction which fell within the normal range, whereas hospital patients (mostly selected cases) were subnormal in this respect. There was no correlation between power of distinction and the amount of vitamin A in the blood. It has been found convenient to express the results of each visual test as a figure rather than a curve. For this purpose the power of distinction is expressed as the total number of test cards visible through Tscherning glasses 1 to 8. For example, if the faintest letter seen through glass 1 is No. 1·75, the patient is assumed to be able to see all letters more distinct than this and the total number of cards visible at this degree of illumination will be 8. To this figure is added the number of cards visible through glasses 2 to 8, and the total obtained is an expression of the power of distinction.

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and Griffiths (1937).† We have seldom observed any significant improvement with practice but it is nevertheless desirable that before giving vitamin A the test should be repeated more than once, or until the readings are constant. Low readings cannot be accepted with certainty as evidence of vitamin-A deficiency unless the administration of vitamin A by mouth or by injection leads to definite improvement.

In association with Prof. J. C. Drummond values for *vitamin A in the blood* and the effect of giving vitamin A by mouth or injection have been determined in a series of normal and diseased persons. Wide fluctuations occur which show little or no correlation with the results of visual dysadaptation tests (Figs. 2 and 3). The carotene content of the blood varies much less than the amount of vitamin A. Curves of blood values showing rates of absorption after the ingestion of 120,000 I.U. of vitamin A (as Adexolin) are shown in Fig. 4. It is our experience that nothing of diagnostic value can be obtained from estimation of vitamin A in the blood.

Vitamin B_1.—Valuable information as to the likelihood of deficiency can be obtained from the application of Cowgill's formula (Cowgill 1934) provided that the vitamin-B_1 intake, the patient's weight, and if possible the caloric intake are known. The clinical indications of possible vitamin-B_1 deficiency include anorexia, cardiovascular manifestations (particularly tachycardia, œdema, and heart failure), aphonia, polyneuritis, and Korsakoff's psychosis. The deficiency is most likely to be encountered in infants, alcohol addicts, pregnant women, and persons suffering from gastro-intestinal disorders. Investigations should include radiographic determination of the size of the heart and electrocardiography. In the presence of vitamin-B_1 deficiency the injection of 1 mg. of adrenaline intravenously produced a rapid fall of diastolic blood pressure, sometimes to zero, with the appearance of "pistol shot" sounds over the arteries of the limbs (Aalsmeer 1932). The procedure must be used with caution.

Various biochemical tests for vitamin-B_1 deficiency have been devised:—

(*a*) *Bisulphate-binding substances (chiefly pyruvic acid)* are increased in the blood in experimental B_1-avitaminosis (Thompson and Johnson 1935) and in fulminating beri-beri (Platt and Lu 1936). In less severe vitamin-B_1 deficiency the finding is inconstant and it is in any case not specific (Wilkins et al. 1937).

(*b*) *Estimation of vitamin* B_1 *in the blood.*—In Schopfer's test it is arranged that the growth of a mould *Phycomyces blakesleaanus* is specifically catalysed by minute amounts of vitamin B_1. The method has been applied to blood by Meiklejohn (1937). Low values have been obtained in cases of polyneuritis, which on clinical grounds were believed to be nutritional in origin, and in most cases of idiopathic hypochromic anæmia, but not in pernicious anæmia and subacute combined degeneration of the cord (see Lects. II and III).

(*c*) *Estimation of vitamin-*B_1 *excretion in the urine.*—

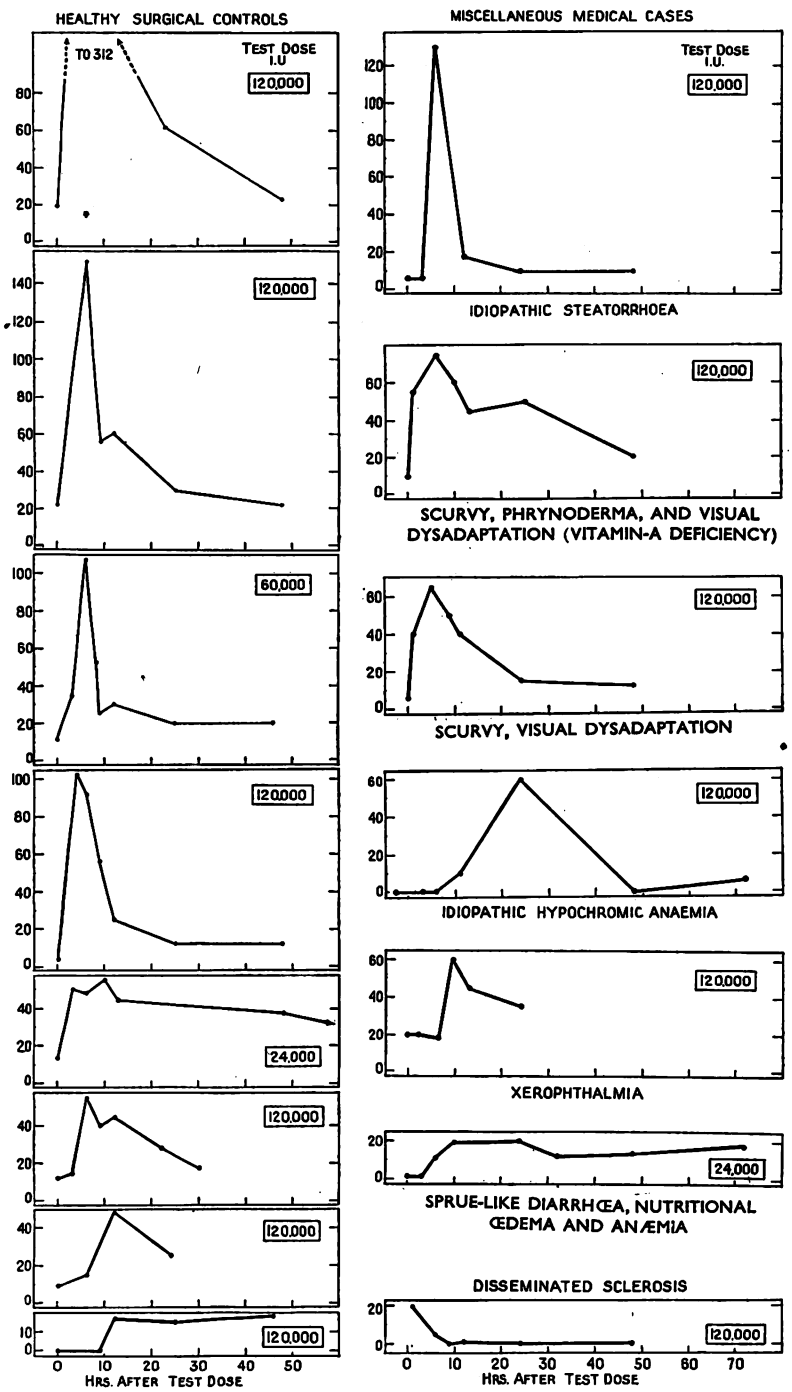

FIG. 4.—Curves showing values of vitamin A in the blood after test doses of vitamin A (usually 120,000 I.U.) as adexolin. There are wide variations both in health and disease, and at present it would seem that the test has no diagnostic value.

† For other methods see Maitra and Harris (1937), Jeans, Blanchard, and Zentmire (1937), and (applicable to infants) Friderichsen and Edmund (1937a and b).

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Harris, Leong, and I (1938) have reported results obtained using the bradycardia test. Simpler and more accurate are the recently described chemical methods (Westerbrink and Goudsmit 1937, Karrer 1937, and Pyke 1937). Some results obtained using a modification of the method of Karrer and Kubli (1937) are shown in Fig. 5.

Vitamin-B_2 complex.—No satisfactory clinical test is available for detecting the heat-stable components of the original vitamin B. Ellinger et al. (1937) have drawn attention to the increased porphyrinuria which occurs in pellagra.

Vitamins C and P.—Vitamin C plays a rôle in the respiration of cells, in the process of oxidation and reduction, and is responsible for the production and maintenance of the intercellular cement substances. Deficiency results in imperfect dentine, osteoporosis, and fragile capillaries.

In otherwise normal persons decreased *capillary resistance* sometimes indicates a state of "subclinical scurvy." In diseased persons capillary fragility may be due to other causes and even in health there are wide variations, the significance of which is poorly understood. Several methods are available, including the modified tourniquet test (Göthlin 1937) and the suction method (see Eddy and Dalldorf 1937, and Schultzer 1934). Another factor concerned with capillary fragility is vitamin P (Rusznyak and Szent-Györgyi 1936). Pure P-avitaminosis has no clinical symptoms. If, however, vitamins C and P are simultaneously withheld, the lack of P will greatly modify the pathological condition (Benthsath, Rusznyak, and Szent-Györgyi 1937). In our experience neither ascorbic acid nor vitamins C and P together in lemon juice have any influence on thrombocytopenic purpura.

Estimation of vitamin C in blood and urine.—The use of 2 : 6 dichlorphenolindophenol as an indicator has the disadvantage that this dye is reduced not only by vitamin C but by other substances in urine which must first be removed. In the present investigation the vitamin-C content of the blood and urine has been estimated by the method of Lund and Lieck (1937) which depends on the decolorisation of methylene-blue in the presence of strong artificial light. The vitamin usually appears in the urine when the serum value reaches about 1 mg. per 100 c.cm. of blood, but a low threshold is sometimes observed (Fig. 7). The resting level in the serum varies considerably in normal persons and at different seasons (Lund, personal communication). Normally, however, the ingestion of a single dose of 600 mg. of ascorbic acid is followed within three hours by a rise in the serum value to above 1 mg. per 100 c.cm. of blood and by the appearance of the vitamin in the urine. In scurvy the resting serum ascorbic acid value is low and only a small rise follows the ingestion of a test dose of 600 mg. With repeated test doses the ascorbic acid content of the serum rises gradually in step-ladder fashion until the threshold value is exceeded and the vitamin appears in the urine (Fig. 6).

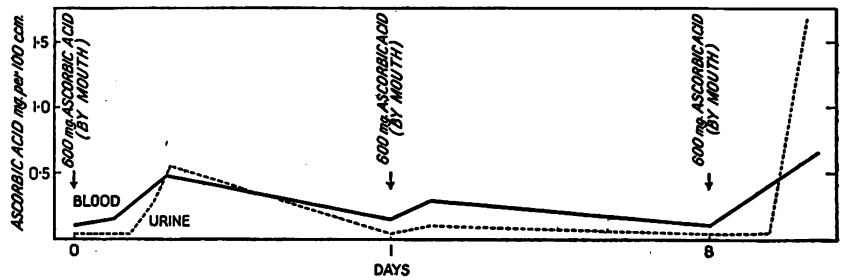

FIG. 7.—Poor responses to test doses of vitamin C (orally administered) in an epileptic with nutritional macrocytic anæmia. The renal threshold for vitamin C is low (cf. Fig. 6).

Since failure to show a response to ingested ascorbic acid may be due to deficient absorption, it is desirable, in certain instances, to compare the effect of giving the test dose parenterally. Ascorbic acid is oxidised in the intestine and absorbed as dehydro-ascorbic acid. In chronic intestinal lesions the power of reducing dehydro-ascorbic acid may be impaired. In such cases lemon juice is more effective than synthetic ascorbic acid (Elmby and Warburg 1937, Lund and Elmby 1938).

An intradermal test for vitamin-C deficiency depending on the rate of decolorisation of 2 : 6 dichlorphenol-indophenol by the tissues has been described (Rotter 1937; see also Portnoy and Wilkinson 1938).

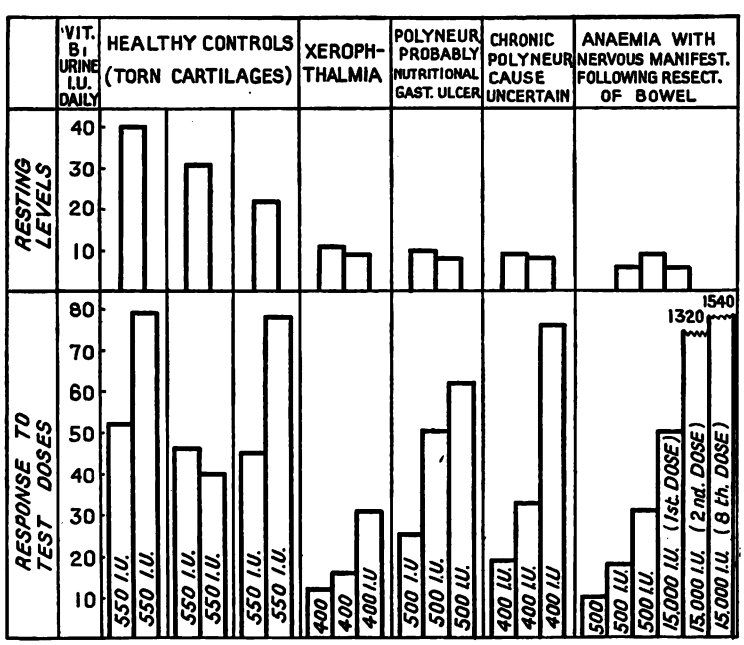

FIG. 5.—A few illustrative cases to show results of tests for vitamin B_1 in the urine by the thiochrome method. The effect of giving vitamin B_1 on the amount of vitamin excreted in the urine is shown. None of these patients showed a gross degree of vitamin-B_1 deficiency. Cases with severe B_1-avitaminosis, in which the urine was tested by the bradycardia method, have shown no response whatever to test doses (Harris, Leong, and Ungley 1938; see also Lect. III).

* * *

In this lecture I have reviewed the causes and effects of nutritional deficiencies and the ways in which they may be detected. My second and

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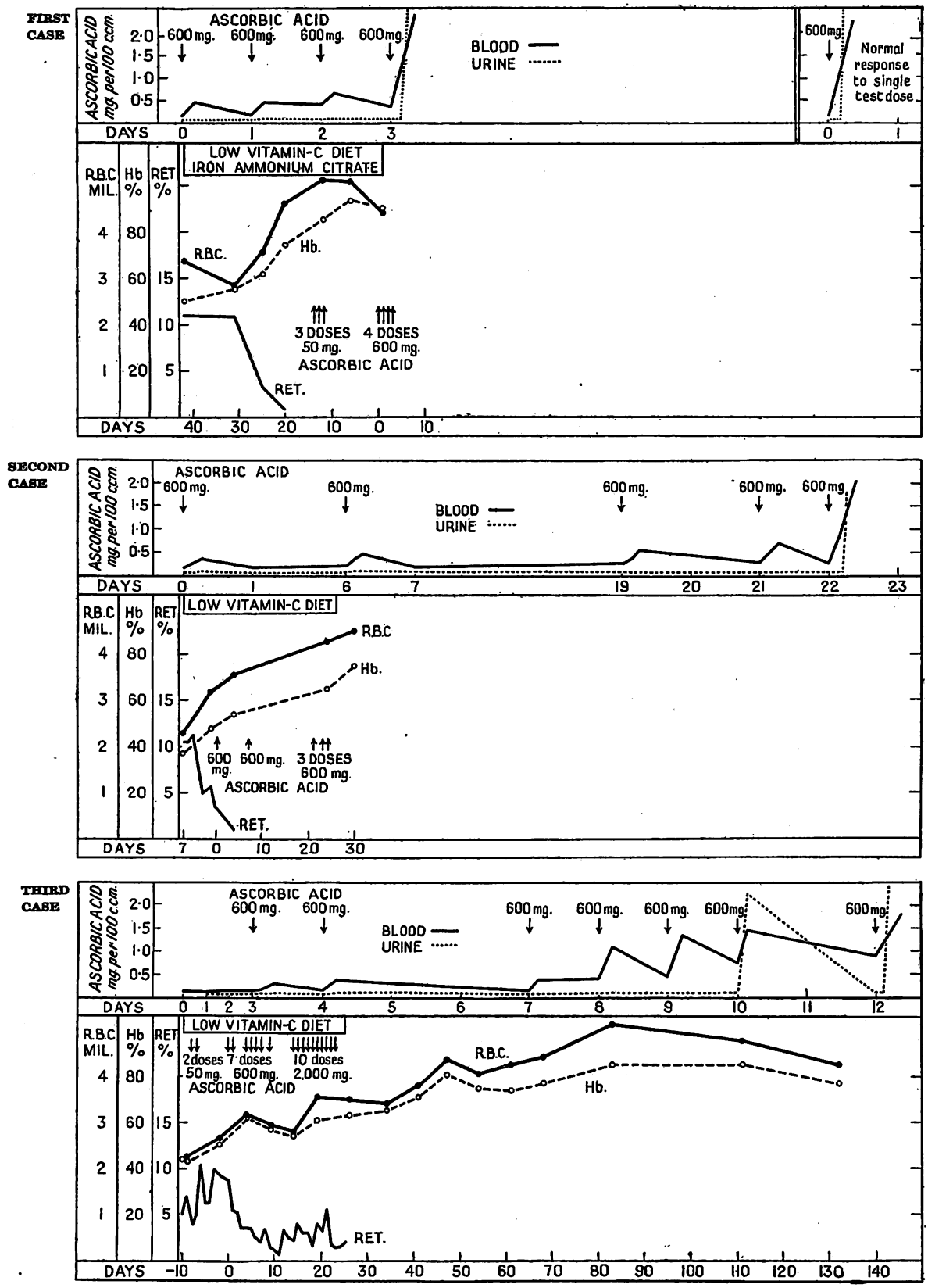

FIG. 6.—Three cases of "bachelor scurvy," showing the effect of test doses on vitamin-C content of the blood and urine. The hæmatological observations will be referred to in Lect. II.

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third lectures will describe results obtained by the application of these principles to the study of deficiency diseases of the blood and of the nervous system.

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THE SCHICK REACTION AND CIRCULATING DIPHTHERIA ANTITOXIN IN MAN

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THE occurrence of a number of cases of diphtheria, mostly mild, amongst Schick-negative individuals has led to investigations and criticism, notably by Jensen (1931), of the reliability of the Schick reaction as a guide to immunity to clinical diphtheria. The work described in this paper was initiated by an epidemic of 8 such cases in an immunised institution (Parish and Wright 1935). It seemed desirable to inquire once again into the antitoxin titres of sera from human Schick-positive and negative reactors, and to see if a definite "Schick level of immunity" could be established.

"SCHICK LEVEL" IN MAN

Schick (1913) and Michiels and Schick (1913) stated that 0·033 unit per c.cm. was the antitoxic level above which a negative and below which a positive reaction might be anticipated. Later, v. Gröer and Kassowitz (1915) found in one Schick-negative reactor only 0·01 unit and in two not more than 0·004 unit. Schick, v. Gröer, and Kassowitz (1924) reported that 0·002 unit per c.cm. is correlated with indefinite positive reactions and that with 0·005 unit the reactions may be negative. Since heated toxin was not used as control fluid, the results recorded in these early papers are not strictly comparable with our own. Originally either no control was employed or it consisted of toxin neutralised by antitoxin. Further, certain of the early workers withdrew blood for antitoxin titration 2–7 days after the Schick test—i.e., at the time of reading—instead of immediately before injection. Obviously the former procedure tends to give higher values than the latter, since the injection of Schick toxin frequently acts as a "secondary stimulus," producing a rapid rise of circulating antitoxin in the potentially immune (Copeman, O'Brien, Eagleton, and Glenny 1922, Parish and Okell 1928).

Jensen (1931) communicated the data in Table I of antitoxin titrations of blood samples from four groups of children—naturally Schick-negative, Schick-

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negative after immunisation, Schick-positive before immunisation, and Schick-positive after immunisation. He showed that the large majority of Schick-positive children before immunisation had less than 0·0005 unit of antitoxin per c.cm.; nearly 30 per cent. of naturally Schick-negative children had less than 0·01 unit per c.cm. and a certain number as little as

TABLE I—SCHICK TEST AND CIRCULATING ANTITOXIN TITRE (AFTER JENSEN)

No. tested.	Schick readings.	Antitoxin titre in units per c.cm.				
		Over 0·03	0·03–0·01	0·01–0·005	0·005–0·0005	Under 0·0005
29	Naturally negative (%).	48	24	7	7	14
179	Negative after immunisation (%).	67	24	4	4·5	0·5
135	Positive before immunisation (%).	0	0	1·5	8·9	89·6
32	Positive after immunisation (%).	0	22	15	44	19

0·0005 unit per c.cm.; a few Schick-negative persons had lower amounts. Jensen drew the following conclusions from this and previous work:—

1. A Schick-positive reaction has real importance, since it always indicates (100 per cent. of cases) that the antitoxin titre of the serum is less than 0·03 unit per c.cm. (in 96 per cent. of cases less than 0·01 unit per c.cm.).
2. In subjects naturally Schick-positive a strong positive reaction signifies in 90 per cent. of cases an antitoxin level of less than 0·0005 unit per c.cm.
3. Children possessing practically no antitoxin—i.e., less than 0·0005 unit per c.cm.—in their blood may nevertheless have a Schick-negative reaction.
4. There is no fixed antitoxin titre (0·03–0·01 unit per c.cm.—the "Schick level") at which individuals pass from the negative to the positive group or vice versa. This titre presents considerable variation from individual to individual.

Jensen thus confirmed in human subjects the pronounced variation in titre previously noted in certain titrations in guinea-pigs by Glenny and Waddington (1929) in their study of the relationship between antitoxin content of the blood and tolerance for toxin. He also affirmed that it was useless to do a primary Schick test because of the fallacies introduced.

Dudley, May, and O'Flynn (1934) regarded as unimportant the very few exceptions to the rule that "for practical purposes in most environments a positive Schick test, in all subjects except young infants, means there is less than 0·01 unit of A.T. per c.cm. of blood and a negative Schick test more than 0·01 unit of A.T. per c.cm. of blood at the moment of the test injection." These observers also stated that the intensity of the Schick reaction is not invariably proportional to the antitoxic content of the serum. For example, when the blood was taken on the same day as the Schick test, 2 of 9 boys who had no detectable circulating antitoxin gave only weak positive Schick readings, whereas others who had antitoxin were strongly positive.

Our preliminary data (Parish and Wright 1935) suggested that the "Schick level" in man was subject to considerable individual variation and that some subjects with as little antitoxin as 0·004–0·002 unit per c.cm. might be Schick-negative. Leach and Pöch (1935) found that 28 (14·3 per cent.) of 196 Schick-negative children had less than 0·01 unit per c.cm. and that 3 had less than 0·0005 unit per c.cm. Brandon and Fraser (1936) and Taylor and Moloney (1937) made parallel tests with the Schick reagents issued by fourteen licencees of the Treasury Department of the United States. Marked differences in the interpretations of the Schick tests were frequently observed, but it is noted that in almost all cases the toxins used did not conform with the standard requirements formulated by the League of Nations. Further, diluted toxoid was often used instead of heated toxin as the control fluid. We have made numerous observations in which Schick toxin, Schick control (heated toxin), and Moloney test fluid (diluted toxoid) were injected into human subjects on the same occasion; these have shown considerable discrepancies in the size of the reactions resulting from the injection of heated toxin and of diluted toxoid. The use of diluted toxoid instead of heated toxin as the control fluid might thus in certain cases result in an erroneous reading of the Schick reaction. Finally, Taylor and Moloney recommended the use of fresh Schick toxins (containing little toxoid) of at least three times the toxicity recommended by the League of Nations. The issue of a more toxic preparation would not be welcomed by a number of clinicians in this country, who regard the reactions produced by the current product as sufficiently intense.

In view of the confusing and often contradictory statements in the literature, further investigation seemed advisable. If the data presented later in this paper are comparatively scanty, they appear to us to be worthy of publication, and have afforded us an opportunity of reviewing the scientific basis and usefulness of the Schick test.

THE "SCHICK LEVEL" IN ANIMALS

Glenny and Waddington (1929) prepared "multiple Schick toxins" (from toxin and toxoid) with combining powers from 1/2 to 200 times that of the single Schick toxin. Each of these contained the same amount of free toxin as the routine standard Schick toxin, and therefore produced in the non-immune guinea-pig the same degree of skin reaction. In the immunised guinea-pig it was possible by the intracutaneous injection of these "multiple toxins" to detect varying degrees of immunity depending on the alteration of the combining power by additional toxoid. The authors concluded that in guinea-pigs the "Schick level" lies between 0·002 and 0·004 unit per c.cm., although it is noted that there were some marked variations in "level" in individual animals. For example, of eight guinea-pigs with a negative reaction to a twofold Schick toxin, one had as little as 0·0005 unit of antitoxin per c.cm., one had 0·002 unit, and six had amounts ranging from 0·004 to 0·04 unit.

REAGENTS AND TECHNIQUE

It is necessary to comment briefly on the reagents we used and on their standardisation.

The Schick dose of toxin was originally fixed by Schick as 1/50th of the minimal lethal dose for a guinea-pig. Glenny (1925) pointed out that the combining power of Schick test toxin should also be defined. In 1931 the Health Section of the League of Nations adopted 1/750th–1/1250th unit as the standard combining power of a single Schick dose of toxin. Recommendations were also made for the toxicity of the reagents; when injected intracutaneously into a normal guinea-pig, 1/25th of a Schick dose should cause a positive reaction, and 1/50th of a dose no reaction. In Great Britain these conditions have to be fulfilled under the Therapeutic Substances Regulations (1931), which include in addition a definition of the Schick control fluid.

In the first part of our research the Schick toxin and control conformed to all these regulations, the

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control in each case being the corresponding toxin dilution heated at 85° C. for 30 minutes. At a later stage we made some experiments with "multiple Schick toxins" of the same toxicity as the ordinary material, but with additional toxoid giving a combining power four and ten times as great. We refer to these preparations as *fourfold* and *tenfold* Schick toxins. The control in each case was the corresponding toxin dilution heated at 85° C. for 30 minutes.

Injections of Schick reagents were made in the case of children into the flexor aspects of the forearms and in most adults into the extensor surfaces of the thighs just above the knees. The volume of each injection was 0·2 c.cm. The Schick reactions were read at various periods after injection, the final readings, on which our conclusions were based, being made on the 7th day. Blood samples were taken *immediately before* the Schick tests were performed. The antitoxin titres were titrated by our colleague, Mr. A. T. Glenny, by a modification of the Römer method, involving intracutaneous injection into guinea-pigs (Glenny and Llewellyn-Jones 1931).

With regard to the accuracy of the figures, it is necessary to direct attention to the method of titration. Dilutions of serum were tested on a twofold range, as a closer series did not appear to be necessary. In the majority of cases the value allotted to the serum meant that the titre was more than a certain unitage and less than twice that unitage. In a few instances a very small difference between two reactions may have determined which of two values —e.g., 0·004 or 0·002 unit of antitoxin per c.cm.—was allotted to a given serum.

THE SCHICK TEST (ROUTINE REAGENTS) AND CIRCULATING ANTITOXIN

Almost all the persons tested had been positive on a previous primary Schick test, and had received one or more injections of diphtheria prophylactic. Samples of blood were taken about four weeks after the first or second injection of prophylactic when many would be expected to show "border-line" immunity, and few would have either no antitoxin or very high values. The Schick tests were performed immediately after the blood samples were taken; 114 persons were available, mostly young adults (volunteers of our laboratory staff and probationer nurses at a general hospital) and children over 9 years of age at a residential institution. The results are shown in Table II.

TABLE II—SCHICK TEST (ROUTINE REAGENTS) AND CIRCULATING ANTITOXIN TITRE: 114 PERSONS

Schick readings.	Antitoxin titre in units per c.cm.				
	0·05 or more	0·05–0·01	0·01–0·002	0·002–0·0005	Under 0·0005
Negative	27	6	8	9	..
Pseudo-negative ..	9	..	4	2	..
Doubtful pseudo-negative	..	..	1	..	..
Positive	..	..	2	31	5
Pseudo-positive ..	1	..	..	5	..
Doubtful pseudo-positive	1	..	2	1	..
Total tested ..	38	6	17	48	5

Note.—A titre of 0·01 but not 0·05 is shown as 0·05–0·01 and not as 0·01–0·002 unit per c.cm. Similarly, 0·002 is shown as 0·01–0·002 and not as 0·002–0·0005 unit per c.cm.

On the basis of the Schick readings, the antitoxin titres could be placed in three groups, as follows:—

(1) 0·01 unit or more per c.cm.—the highest value in our series was 50 units—in which no positive Schick reaction was found, with the exception of one pseudo-positive (2 units) and one doubtful pseudo-positive reaction (0·2 unit), which might have been due to errors in reading. As is well known pseudo-reactions may be difficult to interpret.

(2) 0·01 unit to 0·0005 unit—in which there was considerable variation in the Schick reaction, positive reactions of different intensity, and negative or doubtful reactions being found. Further, some of the reactions in this zone were difficult to read owing to their early or late appearance, or to faint or transient reddening. In this group 11 persons (9, if 2 pseudo-reactors are omitted) who were Schick-negative had less than 0·002 unit of circulating antitoxin per c.cm. of serum.

(3) Less than 0·0005 unit per c.cm.—in which only positive reactions occurred, definite and easily read at the 7th day.

These data are slightly different from those of Jensen, who found some Schick-negative reactors having less than 0·0005 unit. It is possible that further work would confirm his findings, our present series being limited to 114, as against 337 subjects examined by him. Our work, however, confirms his view that it is not possible to fix any definite circulating antitoxin level as the "Schick level of immunity." There appears to be a wide zone of antitoxin titres corresponding to variable reactions.

THE QUANTITATIVE TEST AND CIRCULATING ANTITOXIN

With a view to international agreement on the Schick test dose, the Health Section of the League of Nations in 1931 provided for investigation two Schick toxins differing rather widely in their combining power for antitoxin. Toxin A was neutralised by 0·001 unit of antitoxin—i.e., was equivalent to ordinary Schick toxin—whereas Toxin B was neutralised by 0·003 unit; both contained the *same amount of toxin* and different amounts of toxoid. With each toxin was supplied a corresponding "control" of heated toxin. Jensen (1931) reported the circulating antitoxin titres corresponding to the Schick reactions produced in human subjects by these reagents. He found that, as in the case of reactions produced by ordinary Schick toxin, there was considerable individual variation in the results —e.g., negative reactions to both toxins corresponded in one subject with 0·002 unit per c.cm. and positive reactions to both toxins in another with 0·02 unit per c.cm.

Chesney (1935 and 1937) and Thomas (1937) found that fourfold Schick reagents gave a higher percentage of positive reactions than the ordinary reagents, but as routine blood samples were not taken it has not been possible to correlate these readings with titres of circulating antitoxin.

We ourselves (Parish and Wright 1935) have already published the results of preliminary experiments with "multiple Schick toxins." The results of our present series of investigations with fourfold Schick toxin and control are shown in Table III, and with tenfold in Table IV.

Altogether 61 individuals were tested with fourfold and 39, some of whom belonged to the same group, with tenfold reagents. Almost all the readings were negative to both fourfold and tenfold Schick reagents, when the antitoxin content of the serum was 0·002 unit or more. There were 5 exceptions—viz., 2 positive reactions and 3 doubtful pseudo-positive reactions with more than 0·01 unit of antitoxin

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per c.cm. At titres of 0·002 unit or less as many as 5 out of 25 Schick reactions were negative to the fourfold reagents. With the tenfold reagents 2 negative reactions were recorded with 0·01 to 0·002 unit, and 9 positive reactions were recorded with 0·002 to 0·0005 unit, but one of these was only faint. With both fourfold and tenfold reagents the occurrence of pseudo-reactions often made readings difficult and may have given rise to errors in interpretation. The pseudo-reactions were much more intense with "multiple reagents" than with the ordinary routine preparations; a number of subjects complained of discomfort for some days after injections, and three volunteers of our laboratory staff had to have dressings to allay irritation. The routine use of these preparations in their present form cannot therefore be recommended.

TABLE III—SCHICK TEST ("FOURFOLD" REAGENTS) AND CIRCULATING ANTITOXIN TITRE: 61 PERSONS

Schick readings.	Antitoxin titre in units per c.cm.			
	0·05 or more	0·05–0·01	0·01–0·002	0·002–0·0005
Negative	23	2	2	5
Pseudo-negative ..	4	1	..	..
Positive	..	1	..	15
Pseudo-positive.. ..	..	..	..	4
Doubtful pseudo-positive	3	..	..	1
Total tested ..	30	4	2	25

TABLE IV—SCHICK TEST ("TENFOLD" REAGENTS) AND CIRCULATING ANTITOXIN TITRE: 39 PERSONS

Negative	13	5	2	..
Pseudo-negative ..	8	1	..	..
Positive	1	..	..	9
Total tested ..	22	6	2	9

TABLE V—RESPONSE TO SMALL SPECIFIC STIMULI OF PERSONS WITH LOW ANTITOXIN TITRES ASSOCIATED WITH NEGATIVE SCHICK READINGS

No. of case.	Antitoxin titre in units per c.cm. (March 21st).	Re-Schick injection (March 21st), reading (March 27th).	Antitoxin titre in units per c.cm. (March 27th).
1	0·001	Negative.	0·04
2	Under 0·001	"	0·004
3	0·001	"	0·004
4	0·0005	"	0·04

CIRCULATING ANTITOXIN AND RELATIVE IMMUNITY TO CLINICAL DIPHTHERIA

It is necessary to inquire whether individuals with little circulating antitoxin but a Schick-negative reading are relatively immune to clinical diphtheria. The following observations were made at a school in North London. Blood samples were obtained from 20 children, who were all Schick-positive when read on Feb. 13th or 20th, 1935, and were injected with 0·5 or 1·0 c.cm. of alum-precipitated toxoid (A.P.T.). Table V gives the subsequent history of 4 of them.

The particular interest of these figures lies in (*a*) the low titre of circulating antitoxin associated with a negative Schick reading six days later, and (*b*) the rapid increase in circulating antitoxin within six days of the stimulus of the Schick injection. The figures throw some light on individuals with a low titre of circulating antitoxin but a Schick-negative reaction; a number of these persons are obviously relatively immune and respond readily to the specific stimulus of diphtheria toxin. Of the remaining 16 children 10, who had very little circulating antitoxin on March 21st, 1935, were re-Schick-positive on that date; they showed little or no increase in circulating antitoxin six days after the re-Schick test. Clearly they had much less potential immunity than the 4 children in the first group. The other 6 children had considerable amounts of circulating antitoxin on March 21st, 1935, and were re-Schick-negative on that date.

DISCUSSION

It has long been known (see Glenny 1925) that animals which have once been actively immune remain potentially immune and react to a specific stimulus—e.g., diphtheria toxin—by producing large amounts of the corresponding antibody. Even such a small dose of toxin as is injected in the Schick test may elicit this response. This was first shown in guinea-pigs, but O'Brien (1926) and Parish and Okell (1928) made similar observations in human subjects. Individuals who had once been Schick-negative might relapse to the positive state and have little or no circulating antitoxin in their serum; they were sometimes negative again within one week of the re-Schick test, and showed a considerable increase in antitoxin. The data presented in Table V indicate that persons who are Schick-negative with a low titre of circulating antitoxin may also respond well to a small secondary stimulus. Clearly some persons are more responsive to secondary stimuli than others, their response depending partly on their previous experience of diphtheria toxin or of prophylactic preparations, and partly on individual differences in ability to train the antibody-producing mechanism.

The occurrence of clinical diphtheria implies a weakness of the patient's defences. Either there is insufficient circulating antitoxin to withstand the attack, or the response is not sufficiently rapid to make good the deficiency. Little is known about the antibacterial factors concerned in immunity to diphtheria. Certain gravis and intermediate strains would appear to have greater invasiveness than other strains, and give rise to a more severe type of infection in man; in quantitative virulence tests in guinea-pigs, however, the differences between strains are not so marked, antitoxin prepared with the Park Williams 8 strain being effective against all strains irrespective of their type.

Diphtheria occasionally attacks a person who has once been Schick-negative. Either the circulating antitoxin of these individuals has fallen to a low level, or the infecting dose of organisms has been large or of unusual virulence—usually gravis or intermediate. We ourselves have reported isolated cases and also some outbreaks in Schick-negative reactors (O'Brien, Okell, and Parish 1929, Parish and Wright 1935); the illnesses were usually mild, and in no instance was there a severe attack.

Glenny, Maizells, and Okell, quoted by Okell (1932), found that, of 35 Schick-negative infants between the ages of 3 weeks and 6 months, 29 had less than 0·002 unit of antitoxin per c.cm. of blood and 21 had 0·001 unit or less. Negative Schick tests may thus be correlated in infants with an absence of circulating antitoxin. It will be remembered that Jensen (1931) recorded similar findings in older subjects. Dudley, May, and O'Flynn (1934) have raised the important academic point whether the tolerance of the skin of such subjects to Schick toxin

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may not be part of a general "natural" immunity in contradistinction to acquired antitoxic immunity.

Antitoxic immunity against diphtheria has to be considered quantitatively. Thus, one may find at one end of the scale of "immune" individuals a state of active immunity without detectable circulating antitoxin; the patient is able to make good the deficiency by producing antibody with extreme rapidity in response to a specific stimulus. The chances of severe diphtheria are small in these individuals. From "no detectable antitoxin" one can trace all degrees of antitoxic immunity to the stage at which there is a tremendous amount of antitoxin in the circulation, which would ensure the neutralisation of large amounts of toxin even when rapidly produced, and prevent clinical manifestations of diphtheria.

Our results confirm Jensen's that the "Schick level" in man shows considerable individual variation, both when routine and "multiple reagents" are used. Thus, we found that persons with only 0·002 to 0·0005 unit of circulating antitoxin per c.cm. might be negative to fourfold toxin, and with only 0·01 to 0·002 unit might be negative to tenfold. The existence of non-specific constituents in the fourfold and particularly the tenfold reagents sometimes made readings very difficult, and produced inconvenience and discomfort in protein-sensitive individuals. The routine use of "multiple reagents" cannot therefore be recommended until diphtheria toxin in purer form becomes available for Schick tests.

The dramatic reduction of diphtheria in many immunisation campaigns, where the susceptible child population has been made Schick-negative, shows clearly that negative readings imply a reasonably safe "level of immunity." Nevertheless, cases of diphtheria—administratively troublesome though generally mild—occur from time to time in immunised communities. A safe working rule would therefore appear to be the administration of periodic injections of diphtheria prophylactic to all persons, irrespective of their Schick reaction. Thus, children who have been immunised in infancy with two doses of A.P.T., at an interval of two to three weeks, might receive a third injection of prophylactic at the time of entry into school, and, if experience proved it necessary, a further injection at the age of 9 years. Nurses who have been found to be Schick-negative at the time of entry to hospital might be given one injection of a suitable prophylactic. All subjects showing a Schick-positive or doubtful reaction should, of course, receive the full immunising course. Periodic reinjections maintain a higher level of circulating antitoxin and a more durable immunity to clinical diphtheria than a single course of injections. The recent work of Jensen (1937) on nasal immunisation with toxoid suggests a possible alternative method of maintaining circulating antitoxin at a level sufficiently high to ensure safety.

SUMMARY

1. We have confirmed the observations of Jensen and others that there does not exist a fixed antitoxin titre (the "Schick level") above which individuals are Schick-negative and below which they are Schick-positive. Nevertheless, as is shown clearly in Tables I–IV, there is a much higher level of circulating antitoxin in groups of Schick-negative than in groups of Schick-positive people.

2. 114 persons undergoing a course of immunisation, many of whom were expected to have "borderline" immunity, were Schick-tested with the Schick reagents in routine use in this country. Blood samples were taken *immediately before* the Schick test, and revealed a wide zone of circulating antitoxin values corresponding to positive, negative, and doubtful Schick reactions.

3. Similar tests were made with "multiple Schick toxins," 61 persons being tested with fourfold and 39 with tenfold reagents. Negative reactions to the fourfold reagents were obtained in persons with as little antitoxin as 0·002 to 0·0005 unit and to tenfold with as little as 0·01 to 0·002 unit per c.cm.

4. Pseudo-reactions with fourfold and especially with tenfold reagents tended to make readings difficult and to produce discomfort in protein-sensitive individuals. The routine use of these preparations cannot therefore be recommended.

5. The potential immunity is discussed of individuals with little circulating antitoxin but a negative Schick reaction.

6. The Schick test has been of proved value in many immunisation campaigns, but a negative reaction may not indicate in all cases a state of immunity sufficient to withstand attack by virulent gravis or intermediate strains. To maintain a sufficiently high "level of immunity," the periodic injection of prophylactic into Schick-negative as well as positive reactors may be considered advisable.

We are indebted to our colleague, Mr. Glenny, for his valuable help and criticism at various stages of this work, for preparing and standardising routine and experimental toxins for Schick tests, and for carrying out all the blood titrations.

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SULPHANILAMIDE IN THE TREATMENT OF CHANCROID

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CHANCROID has no mortality, no chronic invalidism, and confers no protection against getting it again. It is often accompanied by gonorrhœa or syphilis—sometimes by both. It is a tedious, trivial affliction of high nuisance rank—highest when with bubo. In medicine it is of interest only because of the shadow of muddled diagnosis which falls on it from the chancre of syphilis, and is still reflected in its name. "Soft sore" must be as chilling to the

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folk mind as "chancroid," for it is uncelebrated in the English ribaldry and bawdy.

Its endemic areas are seaports, its reservoir the cheapest—in our scale of values the lowest—prostitutes. Even among the venereal diseases it is wholly without dignity. It may soon, however, gain an increase in epidemiological interest, for our modern polity has seen the reappearance of the peripatetic whore. She is the lorry girl: and already the lorry driver with chancroid "picked up on the road" appears in the V.D. clinic.

In the last nineteen years over 700 male cases of chancroid, with or without bubo, have been under my care at the Albert Dock Hospital. Though some were infected in the neighbourhood, the great majority —seafarers of almost every race and colour—have acquired the infection abroad, mostly in tropical or subtropical ports, and all (from whom histories could be got) from prostitutes.

PREVIOUS MEANS OF TREATMENT

A survey of these cases shows that length of time, tedium, and nuisance of treatment is much mitigated if the chancroid ulcer be on the scrotum, on shaft of penis, on outside of prepuce, or (in the circumcised only) on the free surface of the glans. Buboes are then comparatively rare, added streptococcal infection very rare, and the ulcer itself not too long a-healing.

With the chancroid ulcer under a prepuce the nuisance is unmitigated. Buboes are frequent and so is the streptococcal infection. Conservation of prepuce meant more often and longer in-patient, and longer out-patient, treatment. The "best" chancroid ulcer openly faces the outside world: for even the diminutive one tucked away almost out of sight in the recess of the lateral fold of frenum and ventral surface of glans in the circumcised is just as often linked with bubo, and devours as much time and trouble as a like chancroid in the same site in the uncircumcised.

There is a traditional exercise of clinical observation and discussion, in an obvious, if limited field, by "the watch below"; and the fo'c'sle has a well-founded knowledge, sympathetically shared ("You know, doctor"), that this subfrenal chancroid has ended or will end in "carrying away the bobstay."

Prepuce and frenum were bars to recovery. Lateral slits, or one mid-dorsal slit, of the prepuce, meant in my hands—whatever the precaution to stave it off—chancroid infection of the cut surfaces of the slit: and equally circumcision, and extirpation of the frenum, meant circumferential and frenal area chancroid. But the circumferential, and frenal area, chancroid thus induced did not take longer to heal than the "slit" chancroids; and nearly all the owners of "slits" eventually, and ruefully, demanded trimming of the preputial flaps.

Both groups were, however, sooner discharged from treatment than if neither slit nor circumcision had been performed. And in all frenal chancroids extirpation of frenum hastened recovery. Furthermore, none I circumcised developed bubo, though some, of course, had bubo to start with. Some of the merely slit did; but so did many more of those whose prepuces were left uncut!

All drugs were ineffective; and so was intravenous protein "shock." Dmelco's vaccine was ineffective too, even as intravenous "shock." The patients, however, liked the extra attention—"the magic of injection." Powders and paints of all colours applied to the ulcers were equally ineffective; all antiseptics equally useless. Diathermic necrosis of ulcer meant a much larger ulcer, and bubo for sure to follow. Prolonged washing of ulcer was a definite help; it enforced an easy access to the ulcer surface, and reinforced the decision not to conserve either prepuce or frenum. So, after years of changes, chops, and comparisons, rules formed themselves:—

1. The chancroid must face openly the outside world.

2. Buboes, if fluctuation is present, must be aspirated, repeatedly if necessary, with all aseptic care: never incised.

3. The chancroid must be washed thoroughly and for long, and every day.

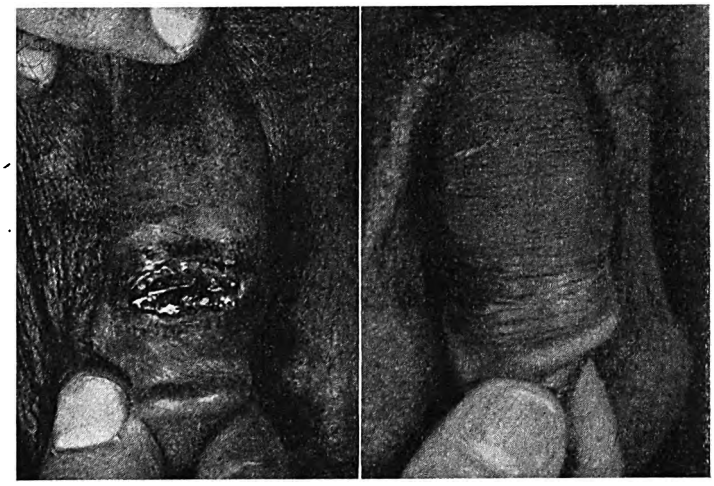

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FIG. 1.—Indian seaman (Mohammedan). Chancroid on shaft of penis three weeks after infecting coitus at Bombay. No bubo.

FIG. 2.—The same after nine days' treatment with prontosil.

Therefore for the last nine years (370 cases to date) circumcision (one mid-ventral and one mid-dorsal suture) has been done for every ulcer under the prepuce, together with extirpation of frenum—as soon as may be, and in fact, in the majority, at once. Operation was always carried out under local anæsthesia, the anæsthetic drug being injected deep-subcutaneously around the root of penis so as to lie on the fascia covering cavernosa and spongiosum. For the last two years Proctocain has been used; its prolonged analgesia makes it ideal for this operation.

In addition at least one hour's immersion of the ulcer in coloured water in a wide-mouthed jar has been required of every patient every day. This immersion ritual gives him a much-needed something to do—for himself. The water from the hot tap in the clinic, when lightly tinted with pot. permang. acriflavine, or methylene-blue, interests him; gives him a ring of colour changes; often provides satisfaction for fancy, and, since "sea lawyers" are many, something to argue about as to merits with his clinic mate (equally afflicted but of a different fancy); keeps him happy, and the ulcer immersed. Under these disciplines chancroid required a few to, sometimes, many weeks' care, even if bubo were absent.

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RESULTS WITH SULPHANILAMIDE

Against this I now put forward my experience with the last 20 cases. These have all been treated with sulphanilamide. Each case received at once 5 c.cm. of 5 per cent. Prontosil soluble (Bayer) injected deep-subcutaneously over the gluteus medius: and one or two further injections, at three-day intervals, of 10 c.cm., and in addition Prontosil album (Bayer) by mouth in divided doses, 3 grammes in 24 hours. There has been rapid healing of ulcer without leaving the old, unmistakable, oft-embarrassing, precipitous-edge scar; and rapid subsidence of bubo in 5–10 days. The impressive surprise came with the first two of these cases, both with large frenal ulcers. After circumcision and extirpation of frenum there was never a sign of chancroid infection of the cut surfaces. The accompanying photographs of two typical cases, before and after treatment,

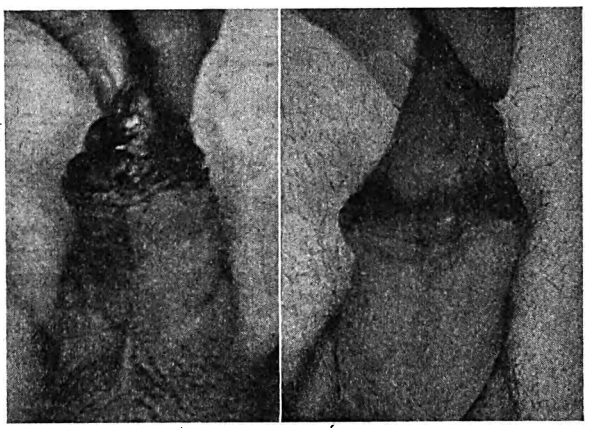

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FIG. 3.—European seaman. Frenal chancroid and bubo three weeks after infecting coitus at Valencia. Photograph taken 48 hours after circumcision and start of prontosil treatment.

FIG. 4.—The same after ten days' prontosil treatment. First-intention healing of wound; chancroid healed without precipitous-edge scar

illustrate well the effect of prontosil (Figs. 1–4). In the last 12 cases, "immersion" has been dispensed with: the ulcer was covered at once with Elastoplast strip and left undisturbed for days. When circumcision was performed, the wound has been closely sutured, covered with elastoplast and left undisturbed for 6–8 days. First-intention healing has been the rule. The raw site left by extirpation of frenum has not become chancroid-infected—even from a frenal chancroid—and has healed rapidly. Not even the still live memory of past times can now make us look on a chancroid as a nuisance: it has joined the chancre to be a relief break in the procession of gonorrhœa.

Throughout the whole period, the daily care and dressing of these lesions—and what is more difficult and more important the management of the case, as a man and a patient—has been ably and critically performed by Mr. J. Lowton; the idea, development, and perfection of the effective immersion technique has been his and it will still be required on occasion. The pathological investigations have been carried out by Mr. A. H. Walters; and for their watchfulness of the cases, and for their assistance, I am much indebted.

THE EFFECT OF ANTITHYROTROPIC SERUM ON THE ACTION OF HUMAN THYROTROPIC HORMONE

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It is well known that the anterior lobe of the pituitary gland contains a substance which, when injected into suitable animals, stimulates the thyroid gland. This substance, named the thyrotropic hormone, produces all the usual manifestations of hyperthyroidism, together with enlargement of the thyroid gland and, under certain conditions, even exophthalmos. The clinical condition of the injected animals is closely similar to human Graves's disease. But as yet no definite evidence has been obtained that the thyrotropic hormone is formed in excessive amount in this disorder; indeed, the evidence so far available points to a diminished, rather than an increased, amount of it in the circulating blood (Cope 1938). This evidence, however, can scarcely be regarded as conclusive, and the possibility remains that this thyroid-stimulating hormone is indeed concerned in the production of the hyperthyroidism of Graves's disease.

Now it was shown as long ago as 1934 by Collip and Anderson that if injection of thyrotropic hormone into an animal be continued for several weeks a state of resistance is gradually set up, so that the thyroid gland of this animal ceases to respond to the stimulus. The sequence is shown particularly well

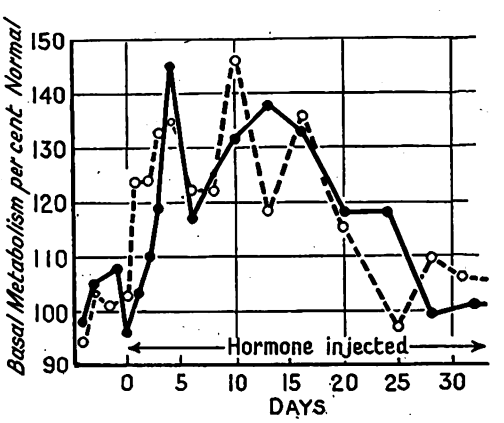

FIG. 1.—Development of immunity to thyrotropic hormone by guinea-pigs.

in the metabolic rate. Under the influence of the thyrotropic hormone this rises rapidly to 30–40 per cent. above the normal. But continued injection will not maintain the metabolism at this high level. After about a fortnight it begins to fall and in 3–5 weeks it is again normal. The thyrotropic hormone no longer influences the thyroid gland and the animal has become resistant. I have been able readily to confirm this observation of Collip and Fig. 1 shows well the development of such a refractory state in two guinea-pigs treated in this manner. Collip was further able to show that if the serum from such a refractory animal was injected into a normal guinea-

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pig, then the latter acquired a passive immunity to the thyrotropic hormone. The serum of the resistant animal possessed strongly antithyrotropic properties.

This fact has been confirmed by numerous observers (Scowen and Spence 1936, Rowlands and Parkes 1936) and is of considerable importance. For clearly, if Graves's disease is due to an excessive production of thyrotropic hormone, the injection of a serum having strongly antithyrotropic properties might be expected to produce a marked diminution in the symptoms of hyperthyroidism and hence to be a valuable method of treatment. It may seem surprising, therefore, that although several workers have produced actively antithyrotropic serum in considerable quantity, yet no reports of its beneficial use in cases of Graves's disease have, so far as I am aware, been published.

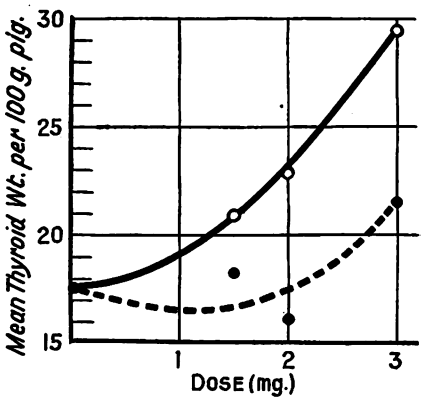

FIG. 2.—Showing the inhibition of the action of ox thyrotropic hormone by specific antiserum. In Figs. 2 and 3 circles = hormone alone; discs = hormone and antiserum.

But it has become apparent in the last few years that these antisera may show a specificity of greater or less degree. Most work in this field has been carried out with gonad-stimulating hormones, and it has been found that sera rendered antagonistic to the gonadotropic hormone from the pituitary gland of one species of animal may not inhibit the equivalent hormone similarly prepared from a different species. Much work on this point has been carried out by Rowlands (1938) who also gives a good survey of the relevant literature.

In view of this species specificity, it seemed desirable to determine whether serum rendered antagonistic to thyrotropic hormone derived from ox pituitaries (the most readily available source) would inhibit the action of human thyrotropic hormone. For if it did not, it was unlikely to prove of therapeutic value in the human subject.

Although most work on the specificity of antihormone sera has been carried out with the gonad-stimulating group, a certain amount has also been done with antithyrotropic serum. The results, however, are somewhat conflicting. Thompson (1936) prepared in a dog an antiserum to sheep-pituitary thyrotropic hormone and found this serum capable of inactivating not only sheep but also bovine thyrotropic hormone. He also claimed that the antiserum inactivated a thyrotropic extract of the urine of human myxœdema, but his results supporting this claim are not very convincing. His serum thus appeared to be non-specific. But Eichbaum, Kindermann, Oestreicher, and Reiss (1937) found that animals made immune to an ox thyrotropic preparation are still capable of undergoing thyroid stimulation by thyrotropic extracts derived from the pig, a result which indicates that the antiserum developed in these animals to ox thyrotropic hormone is incapable of inhibiting the equivalent hormone from the pig.

Apart from the somewhat indecisive result of Thompson, no published report of the effect of such antisera on thyrotropic hormone of human origin seems to have appeared.

THE PRESENT OBSERVATIONS

It has already been found possible to obtain thyrotropic hormone from the human pituitary gland, though the yield is relatively smaller than from the ox pituitary (Cope 1938). For the present experiments human pituitary glands were collected from routine post-mortems and were desiccated in acetone. Over a period of six months 50 glands were obtained with a total dry weight of 4·2 grammes. The glands were finely shredded and extracted for 24 hours with 50 per cent. aqueous pyridine. The active principle was recovered by pouring this extract into a mixture of four volumes of alcohol and one volume of ether, the method being that originally used by Rowlands and Parkes (1934). The total yield of dry powder was 700 mg. This powder had only about 30 per cent. of the thyrotropic activity of a similar preparation from ox pituitaries: 12 mg. was equivalent to one Parkes unit—that is, it required the injection of 12 mg. daily for five days to increase the thyroid weight of a 180 g. guinea-pig to 60 mg.

The antithyrotropic serum was prepared in a pair of rabbits by the daily injection of 25 mg. of an extract of ox pituitaries rich in thyrotropic activity. This extract was made from an "undegreased anterior pituitary powder" kindly supplied by Messrs. Armour and Co. Injection was continued for four months, during the last six weeks of which the serum was strongly antithyrotropic and was removed at intervals by bleeding from an ear vein. The effect of this serum on the activity of the original ox thyrotropic hormone is shown in Fig. 2. In this Figure each point represents the mean thyroid weight of a group of 4–6 guinea-pigs. The members of each group were so chosen that all possible error due to variation in the potency of different samples of antiserum was eliminated.

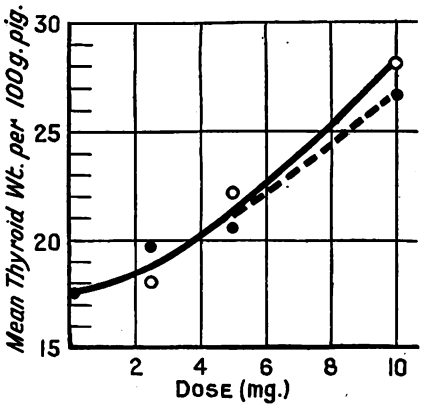

FIG. 3.—Showing the failure of an antiserum to ox thyrotropic hormone to inhibit the action of human thyrotropic hormone.

In the upper curve (circles) the effect of increasing doses of ox thyrotropic hormone on guinea-pig thyroid weight is well shown. Each guinea-pig received the charted dose of hormone subcutaneously for five days and was killed on the sixth. In the lower curve (black discs) is shown the thyroid weights of a second batch of guinea-pigs treated in a precisely similar manner, save that each received in addition 1·5 c.cm. of antiserum injected daily. To avoid in-vitro mixing, the hormone and the antiserum were injected separately at different sites. It will be seen that this dose of the antiserum completely inhibited 2 mg. of the thyrotropic powder, and that 3 mg. produced a thyroid weight of only 21·5 mg. per 100 g. guinea-pig, although in the absence of this

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serum the same quantity of hormone gave a thyroid weight of 29·5 mg. per 100 g. guinea-pig.

The same effect is shown also in the histological appearance of the gland. The unantagonised action of the hormone leads to epithelial hyperplasia and loss of colloid from the thyroid vesicles. The antiserum inhibits not only the weight increase but also the histological changes, the epithelium remaining in the flat or resting state and the colloid persisting unchanged in the vesicles.

In Fig. 3 the same experiment has been repeated using human thyrotropic hormone (circles). Owing to its potency being weaker than that of the ox hormone, larger quantities had to be given to produce a comparable curve. In this Figure the lower curve (black discs) indicates the result of attempting to inhibit the action of the human thyrotropic hormone with the same serum which, in Fig. 2, was shown to inhibit the action of thyrotropic hormone from ox pituitaries. In this curve also 1·5 c.cm. of serum was given on each of the five injection days and here too each point represents a group of five animals. It will be readily seen that this serum inhibits only very slightly the action of the human hormone. With the smaller hormone doses the inhibition is not detectable. With the largest the thyroid weight is reduced only from 28 mg. to 26·5 mg. per 100 g. guinea-pig.

The same result is also indicated by the histological picture. This antiserum had no appreciable ability to inhibit the epithelial hyperplasia and colloid lysis produced by the human thyrotropic hormone.

The effect of this serum on human hormone is thus in marked contrast to its effect on the same hormone derived from the ox.

It is clear that an antithyrotropic serum prepared in the rabbit against ox pituitary shows a species specificity and is practically inactive against the human thyrotropic hormone. It is unlikely that the production of antiserum in an animal other than the rabbit would overcome this species specificity. There is every reason to expect that human thyrotropic serum injected into a rabbit would lead to the development of a serum antagonistic to the human hormone, but we have been unable to produce such a serum because of the limited supplies of human pituitary glands available. The number of glands required to produce sufficient anti-human thyrotropic serum for therapeutic trial in man is a serious handicap to work in this field, and it would seem that some alternative method of producing such a serum is badly needed.

SUMMARY

Antithyrotropic serum, prepared in rabbits against ox thyrotropic hormone, will antagonise the action of this hormone, but has a negligible inhibitory effect on the action of thyrotropic hormone obtained in a similar manner from human pituitary glands.

Owing to this species specificity it seems unlikely that such serum will prove of therapeutic value in the human subject.

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CLINICAL AND LABORATORY NOTES

A POSSIBLE CASE OF LOW RENAL THRESHOLD FOR ASCORBIC ACID

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A WOMAN patient, who was referred to the Royal Berkshire Hospital by Dr. J. Anderson Hill of Mortimer and Mr. J. B. Parfitt, complained of feeling "run down." She had hæmorrhagic gums with free blood along the margins. Films from a swab of the gums did not show any significant infection, and there was no traumatic injury. The condition had been present for over two years, varying in severity with general conditions of health and becoming much worse during a pregnancy. No other abnormality was found.

INVESTIGATION

Scurvy was suspected, but the patient's diet was stated to contain fresh fruit considerably in excess of normal and the urine contained 3·82 mg. of ascorbic acid per 100 c.cm. The plasma ascorbic acid was, however, only 0·76 mg. per 100 c.cm. which is only about 60 per cent. of that given by Deggeller (1936) and van Eekelen (1936) as the criterion of saturation. Since the diet and urinary excretion suggested that she should have been saturated with respect to vitamin C, an ascorbic-acid saturation test was performed. This was done according to the procedure of Harris and Abassy (1937) and the results are given in the Table.

The preliminary test of basal ascorbic-acid excretion gave a figure of 39·6 mg. per 24 hours, which satisfied the criterion for saturation of Harris and Ray (1935) (20–30 mg.) and of Ahmad (1936) (23–35 mg.) In the second part of the test the bladder was emptied at 9 A.M. and a blood sample taken at 10 A.M. The plasma ascorbic acid at that time

ASCORBIC-ACID SATURATION TEST

Time.	Period of urine secretion (hours).	Urine ascorbic acid.		Plasma ascorbic acid (mg. per 100 c.cm.).
		mg. per 100 c.cm.	Total in period, mg.	
10 A.M. ..	—	—	—	0·50
	Patient received 600 mg. of ascorbic acid at 10 A.M.			
12 noon ..	3	32·0	33·5	1·65
2 P.M. ..	2	83·6	51·8	—
3 P.M. ..	1	34·3	17·2	—
4 P.M. ..	1	21·9	8·3	—
5 P.M. ..	1	15·5	5·6	1·16

was 0·50 mg. per 100 c.cm. The patient was then given 600 mg. of ascorbic acid in 50 c.cm. of 0·6 per cent. sodium bicarbonate solution. Complete urine samples were obtained at intervals up to 5 P.M. and blood samples at noon and 5 P.M. These were analysed immediately, using an equal quantity of 10 per cent. trichloracetic acid containing 2 per cent. metaphosphoric acid (Fujita and Iwatake 1935) as deproteinising agent and titrating rapidly with 0·01 per cent. 2–6-dichlorophenolindophenol.

Johnson and Zilva (1934) state in the original paper on ascorbic acid saturation tests that the

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maximum rate of excretion of the vitamin invariably occurs in the fourth hour, and Harris and Abassy (1937) say that little excretion occurs during the first three hours, and it then rises to a maximum in the second three hours. Our patient excreted about 51 per cent. of the total amount in the first three-hour period and only 44 per cent. in the second three hours. At the peak of excretion the plasma ascorbic acid was only 1·65 mg. per 100 c.cm. falling five hours later to 1·15 mg. per 100 c.cm. There is no adequate standard of ascorbic-acid tolerance in saturated individuals but it seemed significant that our patient, living on a diet of very high ascorbic-acid content and having an excretion-rate typical of complete saturation, should show a maximum plasma ascorbic acid, after a dose of 600 mg. of the vitamin, which lies within the normal limits (up to 1·7 mg. per 100 c.cm.) of persons who have received no additional ascorbic acid.

These considerations led us to a tentative diagnosis of "renal scurvy," for we thought it possible that the low plasma ascorbic-acid level was due to an abnormally rapid rate of excretion of the vitamin by the kidney. This hypothesis was supported by the statement by Deggeller (1936) that the renal threshold of ascorbic acid is 0·9–1·5 mg. per 100 c.cm. of plasma, and by that of Faulkner and Taylor (1938) who put the normal renal threshold at about 1·4 mg. of ascorbic acid per 100 c.cm. of serum. This patient excreted a normal amount of ascorbic acid with only 0·50–0·76 mg. per 100 c.cm. of plasma.

She was given 500 mg. of ascorbic acid per day for 12 days. After an interval of 27 hours without any additional vitamin a three-hour urine sample (116 c.cm.) contained 33·8 mg. of ascorbic acid (270 mg. per 24 hours), and the plasma ascorbic acid was 1·44 mg. per 100 c.cm. The condition of the gums had greatly improved, one side of the mouth being completely healed and two or three small red patches remaining on the other side. No free blood was detectable. She felt much better in general health. After one more dose of 500 mg. of ascorbic acid the dose was omitted for two days. At 5 P.M. on the third day the urine ascorbic acid was 11·2 mg. per 100 c.cm., showing that even after 2 days without vitamin the excretion was still very high. The gums were now almost completely healed, with no free blood and only one small red patch over a central incisor.

Unfortunately at this point the patient had to leave the country, so we were unable to make the crucial test of observing the effect of withdrawal of additional ascorbic acid. However her health had improved to such an extent that she wished to continue treatment and she was supplied with 500 tablets of ascorbic acid (Roche) containing 50 mg. per tablet, and told to take 4 tablets daily for a month and 2 tablets daily thereafter. It was hoped by this means to keep the plasma ascorbic acid above 1·0 mg. per 100 c.cm., which is described by Deggeller (1936) as the minimum satisfactory concentration.

SUMMARY

1. A case is reported in which a patient on an adequate diet had a subnormal plasma ascorbic acid together with a normal rate of excretion in the urine.

2. The patient felt unwell and had hæmorrhagic gums of more than two years' standing.

3. A saturation test with 600 mg. of ascorbic acid raised the plasma ascorbic acid to within normal limits, while the greatly increased excretion in the urine occurred more rapidly and at a lower plasma concentration than would have been expected in a normal person.

4. Dosage with 500 mg. of ascorbic acid for 12 days raised the plasma ascorbic acid to normal and led to an almost complete cure of the condition of the gums.

5. It is suggested that the condition of the patient might be due to an abnormally low renal threshold for ascorbic acid.

My thanks are due to Dr. J. Mills, who first drew my attention to the possibilities of this case, for his help and criticism. A detailed account will appear in the Royal Berkshire Hospital Reports (1936–37).

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A DIAGNOSTIC SIGN FOR RETROCÆCAL APPENDICITIS

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It is important for the clinician to know the anatomical variations in the position of the appendix. In some cases a correct diagnosis depends on this knowledge, and the course of appendicitis is influenced by the relationship of the appendix to the neighbouring organs. The varied symptom-complex in the disease is surely due to the great diversity in the location of the appendix, and it is very important to be clear about this.

The position of the appendix is expressed in relation to the cæcum. Most often it arises from the posteromedial side, at the junction of the tæniæ, and hangs freely in the peritoneal cavity. This is the pelvic position of the anatomists, and occurs in 37 per cent. of the cases. Next to this the chief positions are: (1) the ileocæcal, in which the appendix is located in the inferior ileocæcal corner behind the point of entry of the ileum into the cæcum (12 per cent.); and (2) the laterocæcal, in which the appendix encircles the cæcum in front or lies entwined around the ampulla and under it (10 per cent.). Beside these three main positions, which comprise 59 per cent., there are a series of other normal positions, the principal being the retrocæcal.

These figures are taken from a detailed anatomical investigation suggested by Waldeyer and carried out by Liertz (1909) in the anatomical institute of the University of Berlin. The position of the appendix was studied in 2092 cases.

My extensive experience has made it possible for me to study one section of the wide and varied field of appendicitis. These are the cases of appendicitis in which the cæcum lies on the appendix near the posterior wall of the peritoneal cavity—chiefly those in the retrocæcal and ileocæcal positions of the anatomists. From the clinical standpoint they can all be included under the term retrocæcal appendix.

This anatomical position and resulting relationship to neighbouring organs produce a symptom-complex that can easily be recognised by one definite sign, which I shall describe below. The course of the illness is usually not so characteristic.

From my experience I find that disease is more frequent in the retrocæcal appendix than in any other

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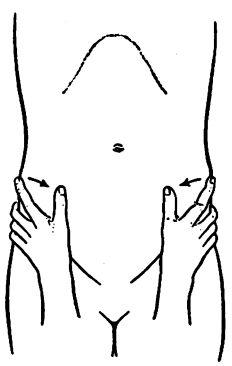
type. I cannot say whether this is because appendices in this location are more prone to inflammation or whether the position depends on racial characteristics —my material was very one-sided, comprising mostly Jews. Of the neighbouring organs the posterior peritoneum that covers the iliac, psoas, and quadratus lumborum muscles are affected first. Next in order come the ureter and especially the ileolumbar vein. The latter is of particular importance in certain complications (Altschüler 1938).

THE SIGN

As in other forms of appendicitis, generalised abdominal pain, beginning acutely often in the region of the stomach, is the chief symptom. Examination reveals a distended abdomen, no muscle spasm, none of the familiar points of tenderness. Only on very deep pressure over McBurney's point will there be slight tenderness in severe cases. In most of these a diagnosis cannot be made at first.



Method of examination.

In all cases, however, I have found one sign absolutely reliable—decided tenderness and definite circumscribed muscle spasm localised over the right pelvic margin.

The third, fourth, and little fingers of the left hand are laid on the outer border of the ilium and the left index-finger on the inner border. If the index-finger is very gradually moved over the soft parts from the anterior superior spine downwards, every case of retrocæcal appendicitis shows a definite, often very painful sensitivity, usually restricted to a small area. In severe cases there is also very definite localised muscle spasm in the same place, sometimes higher, sometimes lower. The abdomen is usually not sensitive to pressure and the usual points of tenderness are absent.

The contrast is particularly striking when the left side is examined in the same manner and not the slightest tenderness is elicited. I have not been able to find this observation described in any of the literature.

The cases with an acute and severe onset that are not diagnosed and not operated on generally lead to retrocæcal and retroperitoneal pus formation. The peculiar thing is that the abscesses often develop without much pain or high temperature, the symptoms being limited simply to generalised abdominal discomfort. The diagnosis of these abscesses is often very difficult, especially when they are not very large. In these cases also the sign described above is an important diagnostic aid.

Diagnosis of the subacute and chronic cases is even more difficult without the aid of my diagnostic sign.

I have seen patients who were treated for a long time as sciatica. I recall two patients who for years suffered from continuous slight elevations of temperature, colicky pains in the region of the large intestine, and diarrhœa, who had been under the observation of reputable physicians and treated as colitis. By means of my sign I recognised these cases as appendicitis, operated, and cured them. Beside these chronic intestinal affections, I saw chronic unilateral kidney affections caused by a chronically diseased retrocæcal appendix. In this class belong also those cases of constant abdominal discomfort with constipation and diarrhœa.

Carefully executed X ray examination is a great help in diagnosis. Oppenheimer (1931) has described the procedure. Notice should be paid to motility, peristalsis, content of mucus, retention, points of tenderness, and functional relationship of the appendix to the ileum and cæcum. In recent years I have had such an X ray examination carried out in almost all the cases and always found it to correspond to my clinical findings.

SUMMARY

A sign is described that is of considerable value in the diagnosis of retrocæcal appendicitis, when the classical signs are absent. Circumscribed tenderness and muscle spasm are found on palpating the right pelvic margin.

The sign is especially useful in the following types of cases: (1) acute retrocæcal appendicitis before tenderness has appeared in the usual position; (2) small chronic almost symptomless abscess after retrocæcal appendicitis without operation; (3) long-standing chronic retrocæcal appendicitis generally diagnosed as colitis. In the chronic cases careful radiography is an additional aid to diagnosis.

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REPORTS AND ANALYSES

ERGO HEALTH BREAD

(POLLEY AND CO., LTD., 44/54, PLYMOUTH-ROAD, LONDON, E.16)

WE have received for analysis a further sample of this bread which is recommended by its makers in cases of diabetes, obesity, and digestive troubles. The loaves weigh 1 oz. each, are bulky in size, attractive in appearance, of even texture, and pleasant flavour. When analysed the following results were obtained:—

	Per cent.
Water	6·74
Ash	0·90
Protein	42·00
Fat	1·10
Crude fibre	0·16
Carbohydrate (altered starch) ..	49·10

Some of these percentages differ from those published after a previous analysis, but the difference is attributable to an error in the figure given for crude fibre. The calorie value of this bread works out at 1774 per lb.; an average figure for the calorie value of white bread is 996. A bread with so high a protein content and possessing nearly twice the calorie value of ordinary bread should be of service to the dietitian.

ROYAL SANITARY INSTITUTE.—The planning of hospitals will be discussed at a meeting of this institute to be held at the new Perivale Maternity Hospital, Western-avenue, Ealing, on Thursday, April 21st, at 2.30 P.M. The discussion will be opened by Mr. L. G. Pearson, F.R.I.B.A., Dr. James Ferguson, medical officer of health for Surrey, and Dr. Thomas Orr, medical officer of health for Ealing. The chair will be taken by Prof. J. M. Munro Kerr. Before the meeting, at 11.30 A.M., an inspection will be made of the hospital.

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MEDICAL SOCIETIES

WEST KENT MEDICO-CHIRURGICAL SOCIETY

A MEETING of this society held at the Miller General Hospital on April 8th, with Dr. H. BOWEN WILLIAMS, the president, in the chair, debated the question That all confinements are best conducted in a midwifery institution.

Confinements at an Institution

Mr. M. P. REDDINGTON, proposing the motion, said that in general he was strongly opposed to the trend of modern medicine towards the establishment of institutions, and to the growing restrictions on private medical practice. The general practitioner must, however, assess his limitations of environment and equipment. One argument in favour of sending the expectant mother to an institution arose out of the fantastic publicity which had been given to the figures for maternal mortality; these had caused an immense amount of harm. Many women were now convinced that a confinement meant a descent into the valley of death. Primary uterine inertia was solely due to this fear in the patient's mind, and to this negative psychological outlook the hospital was an antidote, with its appearance of efficiency and good equipment. There was little doubt that obstetrical emergencies ought to be dealt with in institutions. The toxæmic emergency could not be effectively dealt with in the home. The present method of handling disproportion was to give the patient a trial labour, and as a Cæsarean section might be necessary, the confinement had to take place in an institution. Hæmorrhage also needed the equipment for transfusion and intravenous saline which only an institution could provide. It was also more convenient for the patient to leave her home, where two or three children might be screaming round the house and tradesmen's boys constantly ringing the bell. A much greater factor in favour of the institution was post-puerperal morbidity. Every operation sheet of every London hospital contained at least one operation for prolapse or retroversion. The sequelæ of a confinement could not be properly conducted in the patient's own home. Prolapse was almost inevitable if a woman had to get up after ten days and do her housework, but if she were kept in an institution for a fortnight she was ready to resume her household duties. This argument, of course, applied only to the hospital class of patient. Institutional confinement was also better from the doctor's point of view, for he need not work under the handicaps imposed by the patient's relatives. Moreover, general practice was not the right place for obstetrical work, for a busy practitioner could not give the necessary time and attention to it. His surgery and visits were bound to conflict with confinements. Although he lost touch with his patient during the short time she was in the institution, she would return very glad to be treated as a person instead of as a number. The doctor, on the other hand, was delighted to welcome her back, and to treat the baby for marasmus or anything else that might be necessary.

Mr. J. B. BLAIKLEY, seconding the motion, admitted that experience had shown that straightforward confinements could usually be safely carried through in the home. Nevertheless, every doctor who did much midwifery was only too well aware that emergency might arise suddenly and without warning —e.g., severe post-partum hæmorrhage or a prolapse of the cord—and need institutional treatment. Two or more workers were often needed to carry out rapid treatment, and the mother and child might have to be treated at the same time. A long labour was much easier to manage for an obstetrician who was resident or semi-resident than for a busy general practitioner. The risk of septic infection had in the past been a drawback of the institution, but nowadays, with increased knowledge of puerperal fever and allied infections, the risk was no greater than in the home. The statistics of at least one hospital showed that the incidence of infection by *Streptococcus hæmolyticus* group A was greater on the district than in the wards. Greater precautions must, of course, be taken in an institution to obviate the carriage of infection, but the institutional practitioner was less likely than the general practitioner to come into contact with whitlows or streptococcal sore-throats. In an institution the midwives and nurses were supervised by a competent matron. Many general practitioners did midwifery nowadays only through the compulsion of competitive practice, because if they refused a confinement the woman would go to a rival and her whole family would follow her. Most doctors would probably be glad if midwifery disappeared altogether from general practice.

Confinements at Home

Dr. T. F. MEYRICK, who moved the rejection of the motion, remarked that the two openers seemed to think institutionally and never to have gone out into general practice. Sixty per cent. of all pregnancies were normal, and child-bearing had been domiciliary throughout all human generations. The maternal mortality figures had gone up from 3·74 to 4·1 per thousand in the last thirty years, the very period during which institutional treatment had been growing so rapidly. Officialdom had paid a wholly disproportionate attention to the four women in every thousand who died, and had neglected the vast majority who lived. The mortality figures in the overcrowded areas of London were lower than in less populous areas. Sixteen per cent. of maternal deaths were due to cases of abortion, but they did not include those who had been attended and had lived. The maternity home nowadays sent abnormal cases to hospital just as the general practitioner had previously done. The ordinary patient had great confidence in her general practitioner, and connected the idea of the institution with that of disease. She thus came to look on pregnancy as an illness. In an institution she was passed from one person to another and did not find that she received the same attention as her doctor would have given her. Women were probably immune to the infection latent in their own homes, and no precaution would prevent streptococcal infection in a ward. Many women were discharged from institutions after 10 days or a fortnight still losing blood. Institutions often discouraged patients from consulting their general practitioner again, and insisted on their returning for advice. The institution medical officer, being an obstetrician, was tempted to use surgery on insufficient grounds and to prefer a Cæsarean section to a trial labour. Institutions were also too fond of interference such as radioscopic examination with an injection of lipiodol into the sac. Half-humorously, Dr. Meyrick pictured the growth of a mass-produced population the members of which could never say,

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with Thomas Hood, "I remember, I remember, the house where I was born."

Dr. F. HUDSON EVANS, seconding the rejection, complained that the statistics of mortality and morbidity conveyed a wrong impression to the public mind. Only 7·7 per cent. of all deaths in women were due to pregnancy and labour. The married woman was a better risk than the single woman. He was sure that very few of those present had ever had a woman patient die as a direct result of pregnancy or labour. The figures neglected to allow for the general risk; about 11·6 per thousand. He did not think that his own results in 40 years of general midwifery practice showed any reason for the current agitation for institutional treatment. If reasonable cleanliness were observed in the home and nothing allowed to touch the patient unless it was aseptic, and the doctor were free from oral or nasal sepsis, the patient would be safe. The institutional officer sometimes did not live up to the lavish equipment of his hospital. Dr. Evans detected, in the scaremongering which took place in the press and in Parliament, the work of interested organisers who wished to regiment the people all through their lives with the precision of Chicago pig-killers. It was possible that the registrar-general hid in his bosom the secret that more people died in a year from having their ankles bitten by gnats than from the alleged tragedy of parturition. The organisers had forgotten that the general practitioner had been trained in midwifery and was often quite good at it. Admittedly, those who were not should leave it alone. The municipal councils would do better if, instead of trying to steal the family doctor's midwifery work from him, they would spend some of the money in providing pregnant women with sterile maternity outfits. General practitioners should, however, admit that they ought to manage their confinements better: they should give the same antenatal and postnatal care as the clinics gave. They had an opportunity of doing all these things, because they were the persons to whom the patient first came for an answer to the momentous question—"Is it or is it not?"

DISCUSSION

The PRESIDENT considered that midwifery was better treated in an institution, to avoid conflict with the general practitioner's other commitments and the consequent risk of a hurried application of forceps under an anæsthetic given by the doctor himself.

Mr. H. M. JOSEPH saw the agitation for institutional midwifery as a purely political movement. The patient, especially the poorer patient, much preferred to be confined in her own home, so that she could keep an eye on it and see her friends and her husband every day.

Dr. C. J. B. BUCHAN said that the committee of the British Medical Association which had discussed the provision of midwifery services in London complained that the hospitals took all the cases away from practitioners, and had inquired whether the hospitals could not raise their fees. The answer from at least one hospital had been that they would be willing to pay women to come in. The institutions were therefore in direct competition with the general practitioner.

The meeting rejected the motion by a large majority.

REVIEWS AND NOTICES OF BOOKS

The Public Health Act, 1936

By H. SAMUELS, M.A., of the Middle Temple and Northern Circuit, Barrister-at-Law; and PHILIP FORES, M.A., LL.B., Inner Temple and Lincoln's Inn, Barrister-at-Law. London: Sir Isaac Pitman and Sons. 1938. Pp. 499. 30*s*.

THE experts who lately re-wrote our public health code were successful in introducing greater simplicity, uniformity, and conciseness. Along with their draft Bill they produced a blue-book which clearly explained the proposed changes and the reasons for making them. When the Bill became law the Ministry of Health published its usual expository circulars for the information of local authorities. These official materials furnish the foundation of a text-book. Mr. Samuels and Mr. Fores make full use of them and add, for the benefit of those who were brought up on the Act of 1875, the comparative references from the new law to the old. Part of the apparatus of notes is apt to be mechanical; readers may feel that they do not need to be told after every section that "the Minister" means the Minister of Health; but the authors refrain from dragging in judicial decisions which arose on the old enactments and are irrelevant to the new. They add the subsequent statute about the drainage of trade premises, and they manage to mention the even more recent Factories Act. Future editions will have to print the text not only of the Public Health Act but also of the regulations and orders which flow from it. The orders under Section 314 for amending or repealing local Acts may be hard to trace. The Order in Council under the ingeniously technical provision of Section 346 (2), issued a year ago, deserves mention even if it mainly concerns the metropolis with which the Public Health Act itself, like the volume under review, has not much to do. The book is a careful and adequate guide to a branch of administrative law which many must study.

Feeding Behaviour of Infants

By ARNOLD GESELL, Ph.D., M.D., Sc.D., Professor of Child Hygiene and Director of the Yale Clinic of Child Development, School of Medicine, Yale University; and FRANCES L. ILG, M.D., former Pediatric Research Assistant at the Clinic. London: J. B. Lippincott Co. 1937. Pp. 201. 21*s*.

WE have little but praise for this careful study of the behaviour aspects of infant feeding. Prof. Gesell has made all psychologists his debtors by his painstaking objective studies, which are a mine of facts, quite apart from their value as illuminations of child behaviour and the child-mind. This book deserves study for the facts alone by the pædiatrician as well as by the psychologist, inasmuch as feeding is not solely an event in alimentary life, but a moment of psychic importance to the child, indicating its intelligent grasp of those externals that satisfy an instinct, and its close emotional interest in the process. It is for this reason that the chapters on the behaviour hygiene of the child and the adult-infant relation are of outstanding importance. Prof. Gesell does not accept the psycho-analytic view of the trauma of weaning, nor does he unreservedly accept the pleasure principle as applied to oral activity. On these points psychopathologists will differ from him, inasmuch as the child in the years that follow infancy

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shows many signs of disturbed oral gratification. But objective studies of this kind have an immense value in so far as they put a brake upon over-enthusiastic speculations.

Tropical Dispensary Handbook

Third edition. By CLEMENT C. CHESTERMAN, M.D. Lond., M.R.C.P., D.T.M. & H. Camb., late Physician in Charge, Baptist Mission Hospital, Yakusu, Haut Congo Belge; Membre de la Commission Royale pour la Protection des Indigènes. London: United Society for Christian Literature. 1937. Pp. 299. 7s. 6d.

THIS book presents the outcome of an endeavour to bring together the outlines of medical knowledge for native medical assistants in rural dispensaries in the tropics.

The four sections deal with medical and surgical diseases, minor surgical procedures, drugs and dispensing, and the simpler laboratory methods necessary for diagnosis. An elementary knowledge of anatomy and physiology is assumed and an effort has been made to use simple language. A few statements have crept in for which the scientific support is somewhat shaky, as for example that "blackwater fever is brought about by the presence in the blood of poisons which act in an acid medium, this acid medium being the result of imperfect oxidation in the tissues." It would save some un-learning to say, in a book of this nature, that, apart from the fact that blackwater fever is associated with malaria and precipitated by an antimalarial drug, we do not know what brings about this disease. The "warning symptoms" given as an indication of potential blackwater fever are nothing more than those of chronic malaria.

It is, however, no mean effort to condense into simple form the complexities of modern medicine, and in a volume bereft by its very nature of qualifying discussions and explanatory arguments it is almost impossible to avoid dogmatic statements. Dr. Chesterman has devoted himself to a difficult task with the zeal and skill that characterises all his work, and has produced a book that has already proved its worth; this edition should provide useful guidance not only to those for whom it is intended but to nurses and others assisting in medical work in the tropics.

The Troubled Mind

By HARRY ROBERTS. With Chapters on the *Insanities* by MARGARET NELSON JACKSON. London: John Murray. 1938. Pp. 284. 6s.

THOSE who deplore the number of popular expositions of medical psychology as well as their uneven quality should note that the authors of this one have exceptional qualifications for their task. They are not only entitled from experience respectively in general practice and in mental hospitals to speak with authority on the troubled mind, but their skill in presenting medical issues clearly to the intelligent but uninstructed public and their interest in the social aspects provides additional justification for their entry into the crowded lists. Their book gives a reliable and sensible account of psychiatry as seen mainly from the psychological side. It includes brief clinical descriptions of the various disorders, as well as of mental defect, and some just reflections on sterilisation, euthanasia, and other socio-medical questions. Dr. Roberts, who is responsible for all but the chapters on insanity—and presumably also on mental defect—frequently finds occasion to join issue with Freudian doctrine; his objections are sometimes sound and telling, sometimes less fair and informed. It is perhaps questionable whether polemics are in place in a book of this description, or indeed references (fairly frequent here) to writers whose names and work are likely to be unknown to the non-medical reader. Occasionally Dr. Roberts's obiter dicta make one rub one's eyes—e.g., "sound philosophers and the unimaginative are alike exempt from neurosis"; "the forms and causes, the appropriate treatment and the prognosis are as various in mental as in physical ailments"; and his comment on Pascal. Some of the references to heredity are a little out of date. On the whole, however, in spite of defects associated with compression and simplification the book is clear, accurate, and well balanced. Not only the public but the junior medical student and the nurse would get a better grasp of the subject from it than from some more pretentious books.

Papers on Psycho-Analysis

Fourth edition. By ERNEST JONES, M.D., M.R.C.P. Lond., President of the International Psycho-Analytical Association and of the British Psycho-Analytical Society. London: Baillière, Tindall and Cox. 1938. Pp. 643. 25s.

THIS, the fourth, edition of Dr. Ernest Jones's well-known book contains a good deal of fresh material, some of the papers in earlier editions having been omitted. Each of the thirty-two chapters stands complete in itself, and a reader familiar with the subject may regret that its historical development is not made clear. Recent papers of practical interest deal with problems of adolescence and the relation between psycho-analysis and psychiatry, and the general trend of all the papers is towards the application of psycho-analytical principles to the understanding of actual problems of life and behaviour. The final chapter on early female sexuality reveals a healthy difference of opinion between analysts themselves.

Although Dr. Ernest Jones cannot be accused of undue simplification, yet his language is always clear, and difficult subjects are presented with the minimum of technical jargon. The book can be recommended not only to the specialist but to the medical man who wants an authoritative exposition of psycho-analytical teaching. It contains a glossary and a copious index.

Myocarditis

The St. Cyres Memorial Lectures. London: Eyre and Spottiswoode. 1937. Pp. 152. 10s. 6d.

A LECTURE in memory of Viscount St. Cyres is delivered annually on the subject of myocarditis; and six of these lectures have been gathered in this book to be sold for the benefit of the National Hospital for Diseases of the Heart. In order to include the effects of coronary disease the term "myocarditis" has been interpreted by most of the lecturers in its widest sense so that the book forms an interesting commentary on the development of our knowledge of the subject during the past twelve years. The lecture given by the late Dr. Strickland Goodall in 1927 shows that although it was recognised then that the state of the myocardium might be reflected in electrocardiographic changes, the nature of these was not precisely determined and reliance had to be placed on what might now be considered inadequate

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physical signs. In the lecture for the following year Prof. K. F. Wenckebach, discussing the beri-beri heart, revived the idea that the right heart might fail long before the left. Though little is heard of it in this country, in America the distinction between right and left heart failure is regarded as one of the most important changes of viewpoint of cardiac failure during the past decade. Prof. Wenckebach suggests that the failure of the heart in beri-beri is due to imbibition of water by the myocardium and gives reasons why the older theory of vagus degeneration is an inadequate explanation. In 1929 the St. Cyres lecture was delivered by Dr. R. O. Moon, whose wider view of the causes of myocardial disease contrasts with the present-day obsession with the effects of coronary disease, though he places more emphasis on fibroid and fatty changes of the heart muscle than now appears warranted. Dr. John Cowan in 1930 discusses angina pectoris, pointing out that the theory of muscle ischæmia only partially explains its mechanism; for in most cases of angina there is evidence also of the existence of a highly sensitive nervous factor. This year for the first time in the series of lectures angina is distinguished clinically from coronary thrombosis, and the importance of the compensatory anastomoses which may develop after a coronary thrombosis is recognised. Of the fifth St. Cyres lecture, delivered by Sir Thomas Lewis, no record is available.

In 1932 Strickland Goodall was again called on to lecture. Some of his teaching—for example on the interpretation of the R wave in lead II, and the treatment of heart failure with sufficient fluid to reduce the viscosity of the blood—was unorthodox even then. Five years ago Dr. John Hay delivered the last lecture printed here. By recording a series of cases with electrocardiograms he shows how the use of the electrocardiogram has aided the recognition of lesions of the coronary arteries. He deals briefly with the use of lead IV which was just being brought into service to demonstrate lesions in the silent areas of the heart and has since proved of value in aiding the recognition of atypical and aberrant forms of coronary disease. In his concluding remarks Dr. Hay looks forward to the time when the electrocardiogram will have placed the clinical diagnosis of coronary insufficiency on a sure basis and can be discarded in favour of clinical methods.

L'enchevillement central des fractures diaphysaires

By PAUL-LOUIS CHIGOT. Paris: Masson et Cie. 1937. Pp. 104. Frs.25.

THE work represents the results and conclusions of a combined experimental, pathological, and clinical study of the technique of intramedullary bone-pegging operations and of the different types of bone used for this purpose. The author reports on his experimental findings after using autoplastic, heteroplastic, and os purum grafts in a series of fifteen rabbits and four dogs. The bones, with grafts in situ, were radiographed at once, and regularly thereafter. The specimens were later examined histologically after decalcification. In such radiograms as are shown the progressive disintegration of grafted bone is well seen. A feature of interest in the histological study is that osteoclastic formation was not noted before the sixtieth day after introduction of the grafts. The use of os purum has been shown by Prof. Chigot to jeopardise the strength of osteosynthesis, since he notes a definite loss of resistance as compared with autogenous or homogeneous grafts prepared in the usual way. He reviews briefly the various other materials, metallic and non-metallic, used for osteosynthesis, and expresses the opinion that the principle underlying their use is fundamentally wrong. The wave of opinion favouring the use of stainless steel pins seems to have regressed, and the most recent practice tends to support his view.

Prof. Chigot analyses a series of seventeen fractures in the human subject, most of them recent ones, submitted to intramedullary bone-pegging. He sponsors this treatment in irreducible transverse fractures of the shafts of long bones where the open angle at the fracture line is less than 140° with the axis of the shaft. In our experience, however, such transverse fractures should be capable of reduction by modern traction methods and show little tendency to subsequent displacement if fixation is adequate. Comminuted fractures are acknowledged to be unsuited to this method of treatment.

The account of the author's technique and clinical results is detailed. In 13 of the 17 cases "full function" was obtained, but it is hard to assess the advantages of the method since the criteria of full function as here understood are not enumerated. Another most important piece of information omitted is the average period of disability in the various fractures operated on. Without such standards of comparison it is impossible to evaluate the results obtained or to compare them with those achieved in this country, almost exclusively by closed methods, in such cases as he cites.

A Textbook of Clinical Periodontia

Second edition. By P. R. STILLMAN, D.D.S., F.A.C.D., F.A.A.P., formerly Instructor in Periodontia, Columbia University, New York, and Clinical Professor of Periodontia, New York University; and J. O. MCCALL, A.B., D.D.S., F.A.C.D., F.A.A.P., formerly Professor of Oral Hygiene and Periodontia, Univerity of Buffalo, and Instructor in Periodontia, Columbia University, New York. London: Macmillan and Co. 1937. Pp. 282. 15s.

IN 1922, when this book first appeared, the conception of traumatic occlusion as an important ætiological factor in pyorrhœa was new, and was indeed largely the outcome of work by Stillman and McCall. Since then the theory has been widely accepted in America though it has made little headway in this country. In this edition the book has been considerably revised but not changed in essentials. The authors have adopted the views on the pathology of pyorrhœa put forward by H. K. Box and regard them as confirming their theory. We still find it difficult to understand the suggested rôle of traumatic occlusion in pyorrhœa, or even to understand exactly what is meant by the term. Abnormal occlusal relationships are familiar to all dentists and it is known that they sometimes lead to strain on the supporting tissues of the teeth. But Stillman and McCall seem to go much further than this. They assume the existence of traumatic occlusion and regard the occurrence of pyorrhœa as corroboration of its presence in any case. The rather grandiloquent and confused style of writing does not make this book any easier to follow and the terminology coined by the authors is a further obstacle to its understanding. We are at a loss to account for the way in which this theory has come to dominate dental literature in America.

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THE LANCET

LONDON: SATURDAY, APRIL 16, 1938

PROGRESS AGAINST RHEUMATISM

THOSE of us who were not present in Oxford or in Bath will wish to know how the campaign against rheumatism is going. In the published summaries of papers read at the meetings we may find little that is new, either of fact or of interpretation. But if we look also in an internationally contributed series of papers,[1] which, like the Bath conference, celebrates the 200th anniversary of the Royal National Hospital for Rheumatic Diseases, we shall find something of a conspectus.

Acute rheumatism, "juvenile rheumatism," or the disease that produces arthritic, cardiac, and choreic manifestations, subcutaneous nodules, and erythema circinatum, is now clinically fairly well defined and its course and behaviour are well known; incidentally, the indefinite "growing-pains" of childhood are no longer attributed to it.[2] Its cause is obscure, but less is being heard for the moment of a virus ætiology and increasing emphasis is being laid on the hæmolytic streptococcus and on the nexus between streptococcal sore-throat and attacks or relapses of acute rheumatism following them after a latent period. It is agreed that neither the arthritis nor the carditis of acute rheumatism is demonstrably due to streptococcal invasion of joint or heart, and it is suggested that the morbid changes in those tissues may be brought about by some chemical derivative of the streptococcus acting on tissues in some way sensitised to it. There has been some discussion whether this hypothetical mechanism should be called "allergy"; Prof. LUDWIG ASCHOFF,[1] for instance, says that rheumatism is not an allergic disease but an infective or toxic disease with an allergic phase. The terminology, however, seems unimportant beside the urgent need for elucidation of the reaction in terms of immunological chemistry, and for a means of recognising and forestalling it during the latent period. In this connexion we recall Dr. BERNARD SCHLESINGER'S recent Milroy lectures[3] in which he produced a short series of observations suggesting that when aspirin is given to rheumatic children during and for four weeks after every upper respiratory infection the incidence and the severity of rheumatic relapses following those infections are diminished. This is surely a corner of the rheumatism problem that calls for intensive investigation. Meantime the treatment of the condition resolves itself almost entirely into adequate rest and general hygiene, and, since the majority of the patients belong to the less well-off urban population, that is largely an economic problem. Dr. WILFRID SHELDON[2] referred to the "facilities in this country for the organised control of the period of convalescence" of rheumatic children. Dr. SCHLESINGER described those facilities in greater detail and showed that a reasonably effective system of rheumatism clinics, special schools, and country convalescent homes exists in London, but is lacking in many other parts of this country where rheumatism is rife; it is expensive, but he argues that, even on coldly economic grounds, the prognosis of juvenile rheumatism well managed is good enough to justify it.

Rheumatoid arthritis is less clearly definable as a "clinical entity." It has even been suggested that it has affinities with the juvenile and cardiac rheumatism that we have just been discussing. Dr. F. J. POYNTON[1] brings forward a number of borderline or mixed cases in support of this view and mentions also the well-known occasional finding of subcutaneous nodules in rheumatoid arthritis and the accelerated sedimentation-rate in both conditions. He concludes that the "rheumatisms" are more allied to one another than to any other disease, and infers that some ætiological factor must be common to both, such as, perhaps, a congenital or inherited weakness of connective tissue. The hypothesis, however, is so tentative that Dr. POYNTON offers it to the investigator, rather than to the practising physician at the moment when he is occupied with the diagnosis, prognosis, and treatment of a given case. For there is a difference, which we ought frankly to recognise, between the academic and the practical attitudes of mind in medicine. Dr. PHILIP HENCH,[1] a leader among the American rheumatologists, illustrates this in another way. In an admirably clear and objective summary he marshals the evidence for and against the theory that rheumatoid arthritis is a disease of microbic origin. It is inconclusive. As a clinical investigator Dr. HENCH then admits that the theory can be neither accepted as true nor rejected as false; he regards the evidence for it as stronger than the evidence against it, but preserves an open mind. As a practising physician, however, he cannot wait till the issue is settled; so he accepts the microbic theory as a working hypothesis and treats his patients on the assumption that infection is an important factor in causing their disease. Progress in medicine requires the constant interaction of these two attitudes of mind, each influencing and moulding the other. Dr. HENCH as an investigator described at Bath his observations on the apparent effect of jaundice in causing remission of the symptoms of rheumatoid arthritis; this work breaks new ground and may be a valuable clue to the mechanism by which periarticular swelling and pain are produced.

Gout was the topic of another of the sessions at Bath. It has been attracting more interest of late from several points of view and is by no means a disappearing disease. There is a tendency to narrow its clinical definition to the characteristic changes in joints and bursæ, although Dr. LESLIE

[1] A Survey of Chronic Rheumatic Diseases, contributed by contemporary authorities in commemoration of the bicentenary of the Royal National Hospital for Rheumatic Diseases, Bath, 1738-1938. London: Humphrey Milford, Oxford University Press. 1938. 18s.
[2] *Lancet*, April 2nd, 1938, p. 767.
[3] *Ibid*, March 12th, 1938, p. 593; March 19th, p. 649.

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HILL, in the paper we published last week, argued persuasively for the existence of a truly gouty fibrositis possessing many clinical features in common with typical articular gout. The importance of recognising atypical articular cases that resemble rheumatoid arthritis and spare the great toe, is emphasised; a history of episodic attacks is their characteristic, and the finding of tophi or of a raised blood uric-acid level are confirmatory signs. The relation of the abnormal uric-acid metabolism to the inflammatory attacks in gout is still obscure. Colchicum remains the treatment of choice in acute gout, and cincophen is being less warmly recommended than formerly and more often warned against on account of the risk of hepatitis.

We have mentioned a few of the rheumatological problems in which the slow process of acquiring knowledge, sifting and correlating it, and applying it, is making some progress; there is no doubt that interest is growing and effort is increasing, and it is quite clear that for any whose lines of work bear on it, whether scientific investigators, observant clinicians, or organisers of social welfare, rheumatism is far from being a dull subject.

RHYTHMIC ALTERATIONS IN BRONCHIAL CALIBRE

THE survey by Mr. MAXWELL ELLIS of present-day conceptions of bronchial architecture and function, published in our columns last week, incorporates an account of his own experiments planned to elucidate the nature of the rhythmic alterations in the bronchial calibre which synchronise with the respiratory movements. With the aid of a sensitive method for direct record of changes in the calibre of the bronchial tubes in the anæsthetised dog with closed thorax, he has been able to show that adrenaline dilates and pilocarpine constricts the bronchi. Clear-cut evidence demonstrates the presence of vagal broncho-constrictor fibres which are in a state of tonic activity. The absence, in any of the experiments described, of broncho-dilatation following stimulation of the peripheral end of the cut vagus is in itself important. In the dog the cervical vagal and sympathetic fibres, as also the thoracic vagal and sympathetic fibres, are intimately associated, and sympathetic fibres were probably being stimulated with the vagal broncho-constrictor ones. Although excitation of vagal fibres alone generally causes broncho-constriction, it sometimes gives rise to broncho-dilatation[1] which, moreover, may be produced in some animals by stimulating the peripheral cut end of the sympathetic nerves.[2] How far this latter effect is to be attributed to the presence of broncho-dilator fibres from the upper thoracic sympathetic outflow looping up and then down in the cervical sympathetic bundle, or to an axon reflex, or to fibres with their cells of origin in or above the ganglion nodosum remains uncertain. The importance of the work described by Mr. ELLIS lies in the contribution of definite evidence that uncomplicated broncho-constriction takes place as a result of vagal stimulation in dogs under specified experimental conditions.

The fact that such varying results have been described by different observers should tend to shift the inquiry further afield. If we regard the main aim of investigations on bronchial mechanism in animals to be the acquisition of knowledge which will throw light upon related mechanism in man, then the study of the extrinsic and intrinsic control of the bronchial tubes is not enough. For while we know that in man functional control is often deranged, we suspect that no less often the muscle itself is in an abnormally reactive state. It is recognised that the variations in response of the bronchi and pulmonary vascular bed to similar stimuli may be largely due to the conditions of the experiment, the choice of anæsthetic, and the species of animal selected. Until the significance of these factors can be assessed special caution must be used in applying to man conclusions drawn from the interpretation of animal experiments. The pulmonary reactions of the dog, pig, and guinea-pig to nerve stimulations and to drugs differ from one another and there may even be wide variations in animals of the same species. It is pertinent to inquire whether the pulmonary responses in man resemble any one species type. If they do, to which of the animal species are they related, and under what conditions? Until these are answered we are hardly justified in any assumption that the functional patterns of lung responses in man are more like those in the dog than those in the pig or any other animal. It will be recalled that the failure to reproduce in experimental animals a condition similar in every respect to paroxysmal dyspnœa in man is largely responsible for our ignorance of the underlying cause of this allergic diathesis.

Mr. ELLIS also raises the interesting question of the nature of rhythmic changes in bronchial calibre. He reviews the three possible sources for the production of these movements: intrinsic mechanisms, extrinsic nervous mechanisms, and mechanical influences. His records show that "the bronchial lumen widens during the inspiratory phase and narrows during the expiratory phase of respiration, and that these alterations in bronchial calibre are synchronous with the respiratory movements and accompany them." The results of specially designed experiments made it improbable that extrinsic nervous reflexes are concerned in these rhythmic bronchial movements; as to their possible intrinsic origin, it is conceivable that a rhythmic outburst of impulses from the pulmonary ganglion might give rise to a bronchial rhythm at least as frequent as the respiratory cycles—witness the "rush" peristalsis of the intestines which has been observed, through an abdominal window, to occur in unanæsthetised rabbits. It is significant that the speed of the peristaltic wave is much reduced in animals under an anæsthetic. Such frequent movements of the bronchial muscle have certainly not been observed either in anæsthetised animals or in isolated lung preparations; under

[1] Braencker, W., *Arch. klin. Chir.* 1926, 139, 1.
[2] Dixon, W. E., and Ransom, F., *J. Physiol.* 1912, 45, 413.

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these conditions the bronchial rhythm, if present, is much slower. Although Trendelenburg failed to obtain evidence of spontaneous contractions of isolated strips of bronchial muscle there is unequivocal evidence that slow rhythmic contractions of the isolated lungs or of the trachea do occur spontaneously or in response to stretch.[3 4 5] They are extensive enough to be detected by the naked eye although how far they are due to a true peristalsis or to "peristaltoid" movement is not known. Mr. ELLIS's view that there is insufficient evidence to attribute the changes in bronchial calibre during respiration to any other cause than the mechanical effects of thoracic movements is thus well founded. It seems possible that their control in health or disease will ultimately prove to be both extrinsic and intrinsic.

SEVEN YEARS P.R.C.P.

ONLY twice during the last hundred years have the fellows of the Royal College of Physicians of London invited their president to hold office for more than five years, and since the incorporation of the college in 1518 there have been only seven presidents who have held continuous office longer than has Lord DAWSON. Sir HENRY HALFORD (1820–44) found the college its noble house, but probably none of Lord DAWSON'S predecessors has done more to enhance its prestige and influence. He has regarded the Royal Colleges as being to medicine what the Inns of Court are to law: they are concerned not alone with learning and its advancement, but with the application of learning to current affairs; they have contacts more intimate, more practical, and more human than any exclusively academic body; of all medical organisations they are best fitted to give disinterested advice. Working in close harmony with the Royal College of Surgeons, and also with the new British College of Obstetricians and Gynæcologists, his policy has been to foster the influence which the college should exert in matters of State medicine and of medical education—an influence which, it must be confessed, was on the wane before he took office.

To take its proper place in a live world a college of physicians must keep its ambit wide, and Lord DAWSON has seen to it that the fellowship is truly representative of all specialties and of all parts of the Commonwealth. It has also become more representative of the rising generation. For the younger fellows (as one of them writes) his term of office has been particularly happy, for "he has constantly expressed his desire that they should take an active part in the affairs of the college and he has translated this wish into active encouragement by placing junior fellows on various committees from time to time set up. Moreover he has frequently called on the younger generation to take part in the debates of the regular and special meetings of the comitia; so that the average age of speakers in that august and terrifying assembly must have been considerably lowered in recent years."

Among more specific, though not more important, innovations, Lord DAWSON started the science committee, with representatives of the Medical Research Council and of other bodies granting research scholarships, and initiated the policy of coördinating individual scholarships to large objects—as witness the succession of grants to investigate different aspects of anæmia, the tonsil problem, and rheumatoid arthritis. It was he who had the vision to see that the Prophit bequest, instead of being doled out in unrelated grants, might be used for one vast work, which has actually been started in coöperation with tuberculosis dispensaries, voluntary and municipal hospitals, the General Post Office, the Admiralty, and the universities. When, as often happened, he was asked for personal advice he made it his practice to bring the matter before the college and to act through it. In this way it has taken its share, for example, in guiding legislation on infanticide. He has encouraged its participation in large coöperative schemes such as the curriculum conference and the British Postgraduate Medical School. In a word Lord DAWSON has raised the status of the college from that of a dignified, scholarly, academic body to a position of coöperative leadership in the guidance of the profession and the welfare of the community.

HEALTH OF THE ARMY

ALTHOUGH the general health of the troops throughout 1936 continued to be very satisfactory, the Director-General of Medical Services reports[1] an all-round increase in sickness incidence over that for the previous year. Thus the admissions to hospital exceeded those for 1935 by 35·6 per thousand of the strength, and the number of invalids sent home from abroad was 2·79 per thousand more than in 1935. The principal diseases to show an increase in the year under review were the less serious digestive disorders, skin diseases, and malaria, and, in Egypt and Palestine particularly, sand-fly fever. Judged by the average sick time to each soldier the commands with the highest ratio of incapacity were China, Aden, and Ceylon, and on this standard Bermuda was very much the most healthy station. During the year 1500 invalids, or about 8 per thousand of the strength, were discharged, the main reasons being tuberculosis, otitis media, the effects of old injuries, and schizophrenia.

In 1936, in order to check the falling off in the numbers of recruits, the War Office decided to enlist men below the physical standards with a view to raising them to those standards by special training. A preliminary experiment, confined to men whose weight or chest measurement was unsatisfactory or who had functional defects of the heart, was highly successful, and of 33 men enlisted 24 attained the necessary standards within three months. A centre has therefore been established for the reconditioning of recruits of this type, and a scheme has also been approved by which applicants who are up to standard in all respects except for some curable defect, such as varicose veins or enlarged tonsils, can be enlisted and admitted direct to hospital for treatment.

[3] Horvath, A., *Pflüg. Arch. ges. Physiol.* 1876, **13**, 508.
[4] Luisada, A., *Beitr. klin. Tuberk.* 1930, **73**, 657.
[5] Daly, I. de Burgh, *Trans. med.-chir. Soc. Edinb.* 1936, p. 139.

[1] Report on the Health of the Army for the year 1936. London: H.M. Stationery Office. Pp. 158. 3s.

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ANNOTATIONS

AIDS FOR ATHLETES

Dr. Adolphe Abrahams knows a good deal about the influence of alcohol, tobacco, and other drugs on physical efficiency. To the athlete, he said,[1] the problem of alcohol rarely makes an appeal from a purely moral or sociological aspect. In slavish imitation of the training methods of a famous performer he may take draughts distasteful, perhaps even nauseating. Or the total abstinence of a champion may lead him to regard a drop of any alcoholic beverage as virulent poison. Restriction of drinking in the training of old-time pugilists and pedestrians was obviously salutary, and when athletics became fashionable the young bloods of the period naturally imitated the methods of the professional. But nowadays the chronic alcoholic does not contemplate a course of orthodox training, or if he makes the venture he speedily abandons it, and the modern athlete demands a ruling on the purely scientific side. He asks if alcohol is a special indication in the production of the highest form of physical efficiency or he will accept an assurance that by its use efficiency may be reduced. We are entitled to inform him, said Dr. Abrahams, that there is no evidence that alcohol is a good food for muscular work and that Starling's experiments showed a depressant action upon the mammalian heart, dilatation of the ventricles occurring if the proportion in the blood reached 0·06 per cent. Attwater and Benedict's laboratory estimate of the efficiency of the body as a machine—namely, 29·55 per cent. without alcohol and 25·62 per cent. with alcohol—has been confirmed by investigations during mountain climbing.

The difficulty of assessing the influence of tobacco smoking upon athletic capability lies in the unsatisfactory character of control experiments. Up to 30 years ago, said Dr. Abrahams, the non-smoking athletic young man was a rara avis and any contests that might have been arranged between smokers and non-smokers would have been overwhelmingly in favour of the former. Since then there has been an increasing tendency among young athletes to forgo tobacco, but although more material is available control experiments are still far from convincing. Traditionally smoking is "bad for the wind," but "the wind" is not an entity; it is a convenient synonym for the capacity for exertion, in which a number of factors are concerned. To be sure that smoking is bad for the wind we must be prepared to demonstrate either direct poisoning of the heart muscle, or its nervous mechanism, or some impairment of the oxygen-carrying capacity of the blood. It is probable, in Dr. Abrahams's view, that smoking does reduce efficiency in some measure, trivial it may be; but in modern competition even a tiny reduction is of consequence. Against this is to be set the sedative effect of tobacco on the highly strung emotional type not infrequently encountered in the athletic world. It is significant that while some of the greatest track athletes smoke throughout their training, and even to the moment preceding their contest, long-distance cyclists are almost invariably non-smokers. They do not however abstain from tobacco owing to a conviction that it is bad for the wind, but because they are not interested. The long-distance cyclist, it seems, has a relatively stolid mentality and temperament, with no urge towards stimulants, anodynes, or narcotics.

In his concluding remarks Dr. Abrahams considered the possible existence of some drug capable of producing or increasing physical efficiency. Several preparations have secured an undeserved reputation; suggestion no doubt plays the greatest part in any benefit claimed. But it is, he remarked, possible that a drug which cuts out inhibitions might enable the system to draw upon its reserves of energy in moments of stress. Continental authorities have thought it necessary to warn their athletes against the "dangerous practice of doping." The International Olympic Council at their recent meeting condemned the use of such things, but only in general terms. So far as this country is concerned, Dr. Abrahams said, the practice of doping must be non-existent, adding "whatever obtains elsewhere, the sporting spirit of the nation would revolt against systematic application of anything of the kind, save on special occasions in the interest of strict scientific investigation."

BLOOD TRANSFUSION IN WAR

RECOGNISING the important place that blood transfusion has come to hold in the treatment of injuries, the Spanish Republican Government decided in September, 1936, to set up a transfusion service for the benefit of their armies. The medical officer in charge, F. Durán Jordá, has recently published[1] an interesting and well-illustrated account of his work. It was realised at the outset that a war-time transfusion service depending on voluntary donors must have as its base a large town where enough volunteers are easily obtainable. It must also include a system of storage and distribution by which blood is ready immediately at any point where it is needed by the military surgeons. The headquarters of the service was therefore established in Barcelona, where no difficulty was experienced in finding volunteers. By October last a panel of 4395 donors, mostly young women, had been enrolled; in all the blood had been tested for syphilis and malaria. The four blood groups were represented as follows: Group I, 3·1 per cent.; Group II, 47·5 per cent.; Group III, 7·8 per cent.; Group IV., 41·4 per cent.—the Madrid transfusion unit, described by R. S. Saxton in our columns last autumn[2] found they could dispense with the two smaller groups. The blood is taken from fasting donors, in order to avoid possible coli-bacillæmia and an excess of the products of digestion, which might cause a reaction. From each donor 400 c.cm. is received into a flask labelled with his group and identification number and containing 40 c.cm. of citrate solution. The blood in each flask is tested to confirm the group and cultured to ensure sterility. After 24 hours batches from one group are pooled, filtered aseptically, and kept at 0° C. A specimen is tested after filtration to make sure that there has been no hæmolysis. The blood is then packed in glass ampoules specially designed, with a fitted tube and injection needle, for immediate use, so that transfusion can be easily carried out at any time, under any conditions, and in any quantity. Each container holds 400 c.cm. of blood under a pressure of two atmospheres, and it can be given so quickly by this means that Jordá mentions having himself given 40 transfusions (27 litres in all) in three days.

The transfusion unit consists of a railway coach, fitted with cold-storage facilities, from which supplies

[1] Introducing a discussion on April 12th at the Society for the Study of Inebriety.

[1] Jordá, F. D., *Revista de Sanidad de Guerra*, 1937, 1, 307.
[2] Saxton, R. S., *Lancet*, 1937, 2, 606.

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of blood can be distributed and in which the operation can be performed when necessary. After being inspected to exclude infection, shown by a dark venous colour, and hæmolysis, the ampoule is placed in water at 45° C.; Jordá affirms that reactions can be entirely avoided by giving the blood at a temperature of 42° C. (113° F.), but great care must be taken to avoid over-heating and consequent hæmolysis. The number of transfusions provided by the Barcelona service is not stated, but the only complication reported was an occasional rigor. Observations have been carried out at the centre on the changes taking place in stored citrated blood—red and white cell count, erythrocyte resistance, and the content of complement, glucose, and urea, and on the effect of adding glucose to the stored blood. The results support the view that citrated blood can be stored for at least 7–14 days without serious deterioration, and show that addition of glucose is unnecessary. It has been suggested that the inclusion of citrate may have inconvenient consequences if much blood is given, as in large drip transfusions after serious hæmorrhage. To avoid this danger and to make use of unfortunately large supplies, Dr. Saxton has been experimenting with cadaver blood [3] during his work with the British ambulance unit in Spain. As can be seen from his account on p. 916 of our present issue he has been working under far more exacting conditions than his colleagues in the railway coach, but he has been able to confirm the Russian observation [4] that healthy cadaver blood does not clot on standing and therefore needs no anticoagulant. Clearly this method of transfusion has serious difficulties. Blood must be collected at the front within six hours of death and stored in conditions where it is sometimes impossible to maintain refrigeration. But it is in just these circumstances that suitable live donors are scarce, and with a big and efficiently prepared organisation it might well be possible on a large scale to use the dead to save the dying.

OCCUPATIONAL THERAPY

THE harmful moral effects of unemployment are now a commonplace of social discussion. Occupation, preferably congenial occupation, is recognised to be essential to our well-being; extensive studies are made of the psychological ill effects evident in men who have been long out of work, and facilities are provided for remedying these to some extent; training centres are established; and, in the circumstances of ordinary remunerative work, industrial psychology and vocational guidance are valued, even in their modest beginnings, for what they can contribute to health and happiness. It is therefore natural that occupation as a form of treatment for mental illness should have been much insisted on of late years. In 1933 the Board of Control published a memorandum based on the practice in other countries, which has served as an outline for the organisation of occupational therapy in many institutions here; and now a brochure has been compiled for nurses,[5] and a manual [6] of the subject written by the medical superintendent of a Yorkshire mental hospital. It might seem that the effort to which these publications testify is belated, since in Scandinavia, Germany, Holland, and the United States much had been done before 1933. But, as Dr. Rees Thomas points out in his foreword to Dr. Russell's book, the principles of occupational therapy were clearly stated and its practice introduced in Great Britain a hundred years ago, first of all in Yorkshire by Dr. Ellis at Wakefield and Samuel Tuke at The Retreat, and later in other parts of England and in Scotland. Unfortunately the good beginning was not followed up as it might have been; although patients in mental hospitals worked, it was more for its contribution to the hospital economy than to the patients' well-being that the work was arranged, and esteemed, by those in charge. In this century a fresh impetus to occupational therapy in Germany and neighbouring countries was given by Dr. Hermann Simon, who at Gütersloh demonstrated that there are hardly any of the chronic insane who cannot be induced to work, and that by the energetic use of occupation the behaviour of such patients can be got to approximate to that of normal healthy creatures, with much consequent improvement in the atmosphere of the hospital. His drastic system, however, left little or no room for recreation, and has seldom been adopted elsewhere without modification. In the United States this form of treatment developed on more individual lines: regimentation was avoided and the methods used were successful with those early and acute, or neurotic, cases which are more likely to be met with in a psychiatric clinic than in a mental hospital. Where in England after the late war occupational treatment was specially pursued—e.g., at Gartnavel, the Maudsley, and Dorset House—it was the American rather than the Gütersloh system that prevailed. It is indeed a defect in Dr. Russell's otherwise excellent book that he says so little relatively about the problems which neurotics and acutely melancholic, stuporose, manic, or agitated patients present to the occupational therapist. Since, however, chronic and convalescent patients are the ones who suffer most obviously if they are left to loiter and mope and idle the day away, and these are, moreover, the most numerous among the mental hospital population, they must be the chief object of the occupational therapist's interest. The practical guidance now offered to this end by the publications mentioned will, it may be hoped, gradually be enlarged by the working out of rules and indications for prescribing less arbitrary than those now employed. Research and a theoretical basis are needed.

SEX HORMONES AND HYPERTENSION

IT is now twenty years since Steinach first advocated the operation of "vaso-ligature" as a rejuvenating measure, and from time to time he has attempted to satisfy his critics by modifying the operation. Basing his work on the general assumption that the beneficial results of "vaso-ligature" are due to a renewed secretion of a testicular hormone, he has also continued to seek evidence in support of the view that the arrest of senile processes is due to a widespread hyperæmia, particularly in the brain, caused by the increased hormone production. So far, however, it cannot be said that these claims have been fully justified. More recently he has, with Peczenik and Kun,[1] investigated the action of various male-hormone preparations on male patients suffering from hypertension, in order to ascertain whether the vaso-dilatation which they have described in animals after such treatment would also occur in man, and so relieve the symptoms. They record that there

[3] *Lancet* March 19th, 1938, p 693.
[4] Yudin, S. S., *Ibid*, 1937, 2, 361.
[5] Occupational Therapy. An addendum to the Handbook for Mental Nurses. London: Baillière, Tindall and Cox. 1938. Pp. 16. 6*d*.
[6] Occupational Treatment of Mental Illness. By J. Ivison Russell, M.B., F.R.F.P.S., D.P.M. London: Baillière, Tindall and Cox. 1938. Pp. 228. With 41 illustrations. 6*s*.

[1] Steinach, E., Peczenik, O., and Kun, H., *Wien. klin. Wschr.* Jan. 28th, 1938, p. 102, and Feb. 4th, p. 134.

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was a fall in systolic blood pressure in 31 of 49 cases which were treated with either androsterone benzoate or testosterone propionate, and that in 39 the state of hypertonus, which they differentiate from hypertension, was relieved. They also report that subjective symptoms such as headache, sleeplessness, and tiredness were improved. A further group of patients was treated with small quantities of œstradiol benzoate in addition to the male hormone, and cases which had proved refractory to the administration of male hormone alone showed improvement under the dual injections. In discussing their results, Steinach and his co-workers put the view that the hormone responsible for the vasodilatation and for the depression of the vasomotor centre is similar to the female sex hormone. Work they have published in these columns [2] suggested that male hormone when injected into males is converted into an œstrogenic substance, and they therefore suppose that the success of their clinical treatment in male patients was due to the non-specific influence of the converted male hormone.

It is difficult to evaluate these observations satisfactorily, for the data presented are somewhat inadequate. For example the wide fluctuations which, as is well known, take place in the systolic blood pressure from day to day make it hard to accept Steinach's interpretations of the changes in pressure he records. In this connexion it is noteworthy too that the diastolic pressure—fluctuations in which are usually regarded as having a more direct relation to changes in the vascular system—was either unaffected or raised in most of the cases for which data are presented. One of the more surprising suggestions contained in these papers is that œstrogenic substances necessarily act synergically with male hormone. The dose of 60 μg. of œstradiol benzoate had no effect when injected by itself; yet it considerably increased the activity of a dose of male hormone given at the same time. This finding conflicts with a mass of other experimental evidence which suggests that male hormones and œstrogenic substances are often antagonistic substances, the one neutralising the effects of the other.

As Steinach points out, available means of lowering blood pressure are unsatisfactory, and the fall they produce is often followed by a rise. One of the great advantages claimed by Steinach for male hormone is that its effects last for months or even years. Whether his interpretations are accepted or not, his method should receive a trial.

MENS SANA IN MUNDO INSANO

ONCE a year the British Medical Association gives a member of our profession the chance of telling the public what it ought to know about its own health. The Sir Charles Hastings lecture, delivered last week by Dr. H. Crichton-Miller of the Tavistock Clinic, was stimulating rather than reassuring, for in his opinion the changes in civilisation are all making for the success of authority over independent judgment. Industrial man is passing through an acute phase of biological readjustment, and the increase of nervous disorder among our machine-minding robots is only to be expected unless we can educate the worker to use his leisure for recreation rather than escape. "It is usually supposed," said Dr. Crichton-Miller, "that the machine does damage by adding to the pace of life. The real question is how far we choose to rush through life, and how far we choose, in leisure if not in work, to ensue peace and seek isolation. The really detrimental factor in our mechanised age is not the rush but the choice." Politically, the lecturer believes, the urgent problem of democracy and therefore of our nation is to lower suggestibility in the electorate, and he proposed psychological tests of judgment as a qualification for the franchise. A more viable gleam of hope appeared when he pointed out that "docility, gullibility, obsessions, fanaticism—all the features that invalidate a vote—are for the most part referable to faulty education in home and school"; but it was dimmed by his declaration that no sort of environmental change can ever neutralise the grim fact that the intelligence quotient of the nation is declining. The efforts of the medical profession to ensure that the above-average accept the onus of fertility and the below-average face the necessity of limitation, have "met with organised frustration." A possible, if partial, comment on this assessment of the situation was provided a few weeks ago by Dr. Henry Yellowlees in another address to laymen on mental hygiene in modern life [1]: "I don't think," he said, "we can expect to bring about new heavens and a new earth just at once, but if we can equip our children to carry on with just a little more courage and patience and good cheer than we have sometimes shown, we may well be content." To accept this is not to underrate the importance of the plea for remedial measures which Dr. Crichton-Miller so cogently put forward.

THE CARRIER COW

ONE hundred odd children whose sickness was due to drinking raw milk infected with germs from the dung of a cow which itself was not ill—the ramifications of this outbreak of gastro-enteritis at Wilton [2] like others of its kind recall the story of the House that Jack Built. A certain group of consumers, chiefly children, who drank a particular supply of raw milk on Oct. 26th and 27th, 1936, developed 12 to 24 hours afterwards a temperature of 99° to 103° F., headache, nausea, and severe but transient vomiting; later diarrhœa set in with watery stools which did not contain blood. All the patients recovered. Unfortunately fæcal specimens were not examined till convalescence was well established, and proved negative, but serological tests of the blood of nine convalescents were made. All showed specific agglutination for a salmonella bacillus of type "Dublin," and a bacillus of this type was isolated from milk delivered to the school concerned on Oct. 29th and later from milk supplied by the same producer. No illness was found among the personnel concerned at the farm or dairy, though one of the employees at the distributing dairy had specific agglutinins in his blood; but defects observed in the technique of operating the mechanical milking plant in use at the farm led to the suspicion that the milk might have been contaminated with dung. An examination of blood samples from the herd of 51 cows led to the provisional isolation of three cows giving an agglutinin titre of 1 : 400 or 1 : 800 when tested for H agglutinins against 24-hour-old broth cultures of the "Dublin" organism isolated from the bulk milk. The milk of all three cows gave negative results but the dung of one of them showed a heavy growth, in three separate tests, of the organism. After the removal of the carrier cow from the herd—its fate is not stated—and an alteration in the mode

[2] Steinach, E., and Kun, H., *Lancet*, 1937, 2, 845.

[1] *J. R. Inst. publ. Hlth Hyg.* April, 1938, p. 387.

[2] A Report on an Outbreak of Food Poisoning due to Salmonella, Type "Dublin" and conveyed by Raw Milk. By E. T. Conybeare and L. H. D. Thornton. *Rep. publ. Hlth med. Subj., Lond.* No. 82. H.M. Stationery Office. 1938. Pp. 8. 2d.

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of operating the mechanical milking plant, samples of the bulk milk examined over a period of six weeks gave negative results for the organism.

The only previous outbreak due to the "Dublin" type of salmonella of which detailed records are available at the Ministry of Health occurred in London in 1928 when 22 persons developed gastro-enteritis after eating junket. The authors draw attention to the difference in time of onset of symptoms between this type of food poisoning and the toxic food outbreaks associated with the presence of *Staph. aureus*. In the latter the onset is usually within three hours of the suspected meal and clears up rapidly. On the other hand the diarrhœa in the outbreaks due to salmonella of the "Dublin" type lasts less long and is less subject to relapse than that due to dysentery bacilli of the Flexner type.

Two considerations are pertinent to the outcome of this neat piece of detective work. One is that a medical officer who has incriminated milk or food containing milk as a source of illness should not only investigate its preparation and obtain material for pathological examination from it, as well as from the patients in the acute stages of the illness, but should also bear in mind the possibility of an animal vector and enlist veterinary coöperation. Another more elementary lesson is implied in the comparison of this outbreak with five more serious ones in England between 1929 and 1936 due to infected raw milk, in all of which the milk-supply to which the infection was directly traced had passed routine bacteriological standards for cleanliness. Sir Arthur MacNalty in a prefatory note to this report points out once again—and it is evidently still necessary to reiterate this thesis—that clean raw milk is not necessarily safe milk, and that the only practicable way to reduce the risk of such outbreaks is efficient pasteurisation or some other suitable form of heat treatment.

MEDIÆVAL BATH

THE city of Bath which Mr. James has set himself to describe [1] is not the city of the eighteenth century with which most readers are familiar. The subject which has attracted him is the transition from the small country town, built round the monastic establishment, entirely controlled by the Church, and subsisting principally by the manufacture of cloth, to the prosperous spa (now celebrating its bicentenary) which gradually rose from the ruin which the dissolution of the monastery had brought upon it. Its total population, confined within the narrow limit of the city walls, cannot, Mr. James computes, have reached a larger number than 1200 individuals; and the tortuous lanes and alleys, clustered round the Abbey, ran between small houses with thatched roofs. In 1539 the dissolution of the monastery brought disaster to the place, but the corporation, which till then had been subservient to the bishop and the prior, faced their difficulties with boldness and towards the end of the century had received a charter of full incorporation from the Crown and had been invested with all the property and rights which had formerly belonged to the Church. Before they had reached this height of their ambition they had realised that the future of the city must depend in the main upon the baths. These had been for centuries renowned, but so long as they remained the property of the Church they were of but little value to the citizens, beyond the fact that they attracted a certain number of pilgrims, chiefly, it would seem, of the poorer classes. With the advent of the corporation to power the attractions of the spa were soon improved so that by the middle of the sixteenth century they had become more widely known. In the second half of the century appeared two books lauding the efficacy of the waters: one by Dr. Turner who was also Dean of Wells, and a little later one by Dr. Jones who practised medicine not only at Bath but at Buxton, so that he may be described as the first of the spa specialists. Jones published his "Bathes of Bathes' Ayde" in 1572, and in 1574 Queen Elizabeth paid a visit to Bath and from that date the town could consider itself established as a social centre for the nobility and gentry of the kingdom. Royalty came again in the person of James the First's queen in 1612, and before the first quarter of the seventeenth century had run its course Bath had become the fashionable resort, familiar to most of us in the literature of the next two centuries.

Mr. James sketches from original documents the "renaissance" which thus took place, and makes it clear that from the time the corporation really possessed power there was a continuous and steady rise in wealth and general prosperity. One of the pieces of evidence is the fact that the London companies of players found it worth their while to pay frequent visits to Bath. Between 1577 and 1617 Mr. James has found that fifty separate visits were made by one or other of the companies. He does not name his authority but quotes in inverted commas the statement: "There are very strong reasons for inferring that Shakespeare did visit Bath, though whether as a player or a patient it is impossible to say." We should much like to know the nature of "the very strong reasons," but Mr. James is silent on the point. If we may be permitted a modest grumble it is because Mr. James has in his later pages rather stinted us of his knowledge. He has told us in detail, and the maps and illustrations are there to show us, what Bath was at the beginning of the "renaissance," but there is no map and no information of what it had grown to in 1700. Presumably there had been a great expansion of the older city, and presumably at some date in this period the old city walls had disappeared. All that Mr. James has told us is that the corporation quite early in the period forbade the thatching of roofs. He tells us a good deal of the various improvements to the baths but leaves us ignorant of the building of the rest of the city. Perhaps in the second edition of his book the author will make this good.

TRICHINOSIS IN THE UNITED STATES

THE available statistics concerning trichinosis in the United States have been brought together by Dr. Sawitz of the department of tropical medicine in Tulane University of Louisiana.[1] Such statistics can, as he points out, give no more than a rough idea of the real incidence, for not all the States require cases of the disease to be reported, while autopsy data suggest that the official figures are too low in States where notification is compulsory. Nevertheless the data deserve attention. The cases of human trichinosis reported to the Public Health Service in 1915–36 number very nearly three thousand, and since 1930 the annual quota has risen from under a hundred to over five hundred—i.e., from a case-rate of about 1 per million population to 4·5 per million. Whether this statistical increase denotes a real increase it is impossible to say. The ratio of

[1] The Baths of Bath. By P. Rowland James. Bristol: J. W. Arrowsmith. Pp. 169. 5s.

[1] Sawitz, W., *Publ. Hlth Rep.*, Wash. March 11th, 1938, p. 365.

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deaths to cases gives a falling fatality-rate in recent years so that possibly milder cases are to-day being reported which in earlier times would have been unrecorded. Increased interest in the disease may therefore be a factor in the observed rise in incidence. On the other hand Sawitz finds a possible explanation of an increase in mild cases in a change in the preparation of pork products. Formerly such products were usually prepared from one animal and an infected animal might produce severe cases in a limited population. Now sausages and other products are the result of mixing meat from many hogs. An infected animal may thus carry infection to a larger population but in a "diluted" form. On the other hand, such dilution of infected with sound meat does not hold in all countries. Hallén, for example, reports [2] an epidemic of this infection affecting certainly 51 persons in Lindesberg, Sweden, in May and June last year, the result of the importation from Västergötland of three pigs. These went to one establishment and were distributed as raw ham and raw sausages. The owner, his brother, his two assistants comprised four of the nine men who were known to be infected, the rest being women who apparently tasted the raw minced meat when making it up for cooking. There were no deaths. The illnesses were closely followed in 41 of those in whom a diagnosis was made, and in view of the difference of opinion regarding prenatal infection it is of interest to note that one of them was pregnant and was delivered, on the 17th day of her illness, of a girl in whom no evidence of the infection could be detected—a finding which falls in with that of Augustine [3] on a primipara whose infection took place about three weeks before delivery.

To supplement these figures of notifications Sawitz has made a compilation of all cases of trichinosis published in medical journals, and finds that in total between five and six thousand cases have been diagnosed and reported in the United States in the last 100 years. A far higher incidence than this, however, must occur if the statistics of trichinella infections found in autopsies are trustworthy and representative, for Sawitz quotes 3322 post-mortems, in which a real search for trichinella was made, as giving 12 per cent. of positive results. Raw pig's flesh is not commonly regarded in this country as a dainty, so that even should such measly meat pass inspection any outbreak caused thereby is likely to be restricted to immigrants who do not consider its proper cooking a necessary preliminary to its full enjoyment.

TREATMENT OF ACTINOMYCOSIS

RADIATION is very successful in treating actinomycosis localised about the face and neck, fortunately the parts most often attacked; elsewhere it gives disappointing results. Renander's observations [4] at Radiumhemmet in Stockholm confirm previous reports, such as that of R. Stewart Harrison, on which we have previously commented.[5] In the Stockholm series of 52 cases 31 were cervico-facial, and cure was effected in 26. There were 5 fatal cases, in all of which the complications were severe; 2 died after extension of the infective process to the base of the skull, and 1 after it had spread to the mediastinum; pyæmia accounted for a death and profuse hæmorrhage from the tonsillar region for another. The symptoms cleared up as a rule after six months' treatment, but occasionally longer treatment was required. In 13 cases of abdominal actinomycosis Renander found 12 confined to the ileocæcal region, the exception being in the transverse colon. Of these only 5 recovered. All 3 of the thoracic cases ended fatally, as did another with advanced actinomycosis of the female generative organs, and 2 involving the thigh and trunk. The 2 remaining cases were purely cutaneous and recovered. The difficulties of treatment probably arise from application, for irradiation is satisfactory for cutaneous surfaces but not for organs. The choice lies between radium and X ray therapy. No one imagines that surgery is satisfactory; even if it succeeds in eradicating the disease, it does so with considerable mutilation. Potassium iodide though palliative is not curative, and Renander does not think much of it, though Harrison found it useful. With 3 exceptions, in which radium was used alone, all Renander's cases had X ray treatment; this was combined with radium in 15 cases. He used the radium either in the bomb, applied at 5 mm. from the surface and referred to in his report as "teleradium," or by direct application in tubes arranged on the skin surface or introduced into a fistula. The tubes, containing 5–10 mg. of the element, are fixed at intervals of 2–3 mm. on a sheet of lead 1 mm. thick. As the tubes themselves have a filter of 1 mm. of lead, the combined effect is that of a 2 mm. filter. This application is left in place for 15–20 hours. The skin reaction is apparent three weeks later, but is not serious. Radium was used mainly in the cervico-facial type; and teleradium was always combined with X rays. In two or three cases superficial radiation alone proved successful. X ray therapy was given at intervals of 6–8 weeks. In each series of treatments the patient received a dose daily or every second day until a total of 1 unit skin dose (H.E.D. corresponding to 15 Holznecht units) had been given to each dermal field. Roughly $\frac{1}{8}$ to $\frac{1}{4}$ H.E.D. is given at each sitting. Renander points out that at the time when these cases were under treatment the unit r had not yet been adopted. He agrees with Harrison that this fractional method causes less local reaction and does less damage to the skin than does the massive individual dosage. He gives a careful clinical account of his cases which should be useful to radiologists faced with the treatment of this rather rare and distinctly troublesome disease.

ON Monday evening Dr. ROBERT HUTCHISON was elected to succeed Lord Dawson as president of the Royal College of Physicians of London.

Dr. EDITH SUMMERSKILL, who was returned to Parliament at the West Fulham by-election last week, had stood unsuccessfully for Putney in 1934, and for Bury at the general election of November, 1935. Dr. Summerskill qualified from Charing Cross Hospital in 1924 and is the wife of Dr. Jeffrey Samuel who practises in Wood Green. She is a member of Middlesex County Council.

TAVISTOCK CLINIC.—Dr. Wilhelm Stekel of Vienna will give six lectures at the clinic on Thursday at 8.30 P.M., beginning on April 28th. He will speak on active analysis (a technique of psychotherapy), and the lectures will be open only to medical practitioners. Further information may be had from the educational secretary of the clinic, Malet-place, London, W.C.1.

[2] Hallén, L. G., *Acta med. scand.* 1938, **94**, 354.
[3] Augustine, D. L., *Amer. J. Hyg.* 1934, **19**, 115.
[4] Renander, A., *Acta Radiol.* 1937, Suppl. No. 35.
[5] See *Lancet*, 1934, **2**, 367.

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SPECIAL ARTICLES

NIGHT-BLINDNESS AND VITAMIN-A DEFICIENCY

THE USE OF THE BIOPHOTOMETER

BY N. T. GRIDGEMAN

AND

H. WILKINSON, Ph.D.

(From the Food Research Laboratory, Lever Brothers and Unilever Limited, Port Sunlight)

SEVERAL photometric investigations of dark-adaptation, the clinical manifestation of hemeralopia or night-blindness, have lately been carried out in this country, in which have been used one of two techniques or modifications of them—viz., that of Edmund and Clemmesen (1936) and that of Jeans and Zentmire (1933, 1936, and 1937). Using the former, which requires the subject to differentiate large type-letters printed in nine shades of greyness from a white background (illumination being controlled by a series of Tscherning photometric glasses), Mutch and Griffith (1937) measured the adaptation of 130 young adults and children. They were able to show that subjects with poor adaptation responded to vitamin-A therapy. Using the Jeans-Zentmire technique, in which the subject has to discern the centre spot of a quincunx of unequally illuminated perforations in a black screen (illumination being controlled by a movable Goldberg optical wedge), Maitra and Harris (1937) examined the adaptation of several hundred children and adults. They demonstrated that about 30 per cent. of the children (from East London) and about 10 per cent. of the adults (mostly university students and staff-members) gave subnormal readings, and that 75 per cent. of the subnormal school-children were restored to normality after the administration of 15 drops of halibut-liver oil daily for four weeks.

A new apparatus called the Biophotometer (Fig. 1) has recently been marketed by the Frober-Faybor Company Inc., of Cleveland, Ohio. The design of this instrument is based on that of the Birch-Hirschfeld photometer used by Jeans and Zentmire, but it purports to standardise the conditions of testing, and to refine the method of adaptation measurement to a greater extent than is realisable in any of its forerunners. If either of the apparatuses mentioned above is used, the method of testing a subject is to seat him before a large, brightly illuminated screen for a given period of about 3–10 minutes, then to plunge the room into darkness and take a series of visual-acuity readings at regular intervals for about ten minutes. This gives a measure of the rate of recovery of adaptation. The biophotometer improves on this procedure in several respects. During the whole of the test the subject looks into a light-proof eyepiece—which eliminates dangers of stray light or of the wandering of the eyes to objects of interest in the room. Secondly the "bleaching" is carried out by exposing the eyes to a ground-glass screen indirectly illuminated by a standard light source. Thirdly the illumination of the quincunx of spots is not controlled by means of a movable optical wedge but by having a fixed wedge in front of a small electric light, the intensity of illumination of which is adjustable by a variable resistance. The dial readings on the resistance box are calibrated with the corresponding illuminations in millifoot-candles at the centre spot. The change-over from "bleach period" to darkness is effected by means of a switch, which extinguishes the bright light and simultaneously throws the black screen and the quincunx into position. A small time-piece fitted with a bell-alarm is incorporated in the instrument.

Each reading is taken by switching on the quincunx at maximum brightness, slowly "fading" it until the subject says that the centre dot has just disappeared, and recording the illumination at that point. It is recommended to take a series of such readings over the first ten minutes immediately after entering the room, then to give a five minutes "bleach," and finally to take a series of readings over the next ten minutes.

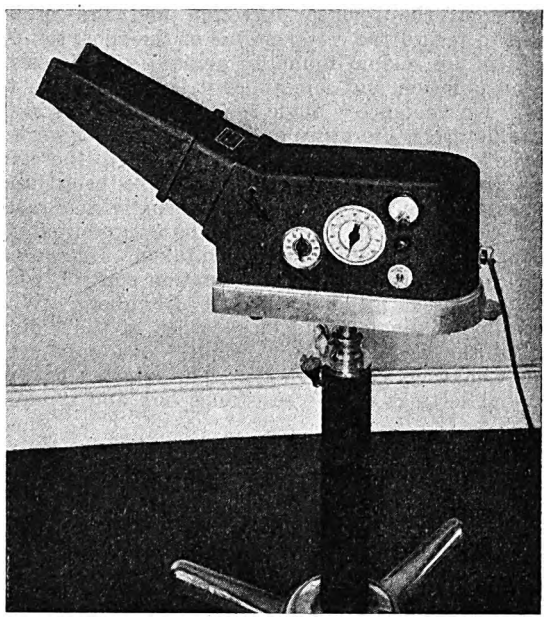

FIG. 1.—The biophotometer.

If the readings, in millifoot-candles, are plotted against time, the types of curves to be expected are those shown in Fig. 2.

Using this method, Jeghers (1937) has conducted a survey of hemeralopia among the students of his university; he has been able to show a significant relation between their powers of dark-adaptation and their diets. He classed 35 per cent. of his subjects as subnormals, all of whom he was able to cure by the administration of daily vitamin-A doses of the order of 30,000 I.U. over periods varying from three weeks to three months.

There is nothing in Jeghers's paper to suggest that he found any imperfections in the technique, but Palmer and Blumberg (1937), in the course of examining 585 school-children, concluded that the biophotometer was unreliable for diagnosing hemeralopia for the following reasons:—

(1) That the control of the illumination of the quincunx is such that the sensitivity attainable at the "bright" end of the scale is considerably less than that attainable at the "dim" end.

(2) That the "learning factor" was large enough to discountenance the value of curative tests. Improvements were noted in the second and third readings of a significant number of untreated school-children.

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(3) That, in view of the subjective nature of the test, the establishment of standards of normality was difficult.

These two somewhat conflicting views are the only ones we know to have been published to date.

Through the courtesy of Mr. Frohring of Eff Laboratories Inc., Cleveland, Ohio, we have been given the opportunity of using a biophotometer for adaptation tests on factory employees at Port Sunlight.

TECHNIQUE

In the course of the early trials with the instrument two difficulties were encountered. The first—which was not due to any fault in the biophotometer—was a discrepancy noted between what have been called the "disappearance" and the "reappearance" readings. If, after the subject has recorded the *disappearance* of the centre spot, the pointer is rotated in the reverse direction and the subject asked to record the *reappearance* of the spot, the two readings are seldom found to agree; sometimes the second is lower, and sometimes it is higher, than the first. No reference is made to this point either in the manufacturers' literature or in the published work of biophotometer users; it is to be assumed, therefore, that disappearance readings only have been used; but as there is no reason for favouring either rather than the other, in the results here presented the average of both readings has been taken. The second difficulty was that of the illumination control, which was criticised by Palmer and Blumberg. While quite fine differences can be recorded at the "dim" end of the scale, at the "bright" end only crude approximations can be made. The relation between the dial settings on the resistance box and illumination is not linear but logarithmic, which in practice means that for successive equal increments of dial readings the corresponding illumination decrements are not equal but progressively smaller. This is a normal characteristic of a filament lamp undergoing constant rate of change of voltage.

A few figures taken from the dial-setting/illumination Conversion Table show what large differences exist:—

Range of illumination in millifoot-candles.					
2·9	to 2·6	(a diff. of 0·3) is covered by	1	dial division.
1·0	to 0·69	(„ „)	„	4	„ divisions.
0·315	to 0·015	(„ „)	„	32	„ „

This defect is serious where hemeralopics are concerned, for most of their readings will be in the "bright" region where delicate or even moderately sensitive control is impossible; and it becomes serious for all subjects when the immediate post-bleach readings are attempted. At this point the readings are not only always in the "bright" region but they are improving markedly from second to second because of the rapidly rising visual acuity. The operator finds he has not the time to take careful readings at the very point where accuracy is of paramount importance.

In order to obviate this difficulty a novel technique was used; instead of taking immediate post-bleach readings at time intervals, the illumination of the centre spot was set at the same reading (0·76 millifoot-candles) and *the time in seconds taken to discern this spot* was recorded. This has been termed the "time value." Then, sixty seconds after the turnover from the bright light, a normal double reading was taken (except in those few cases where the subject took more than sixty seconds for discernment at 0·76 millifoot-candles), and then a final reading after five minutes, so that each complete test occupied twenty minutes.

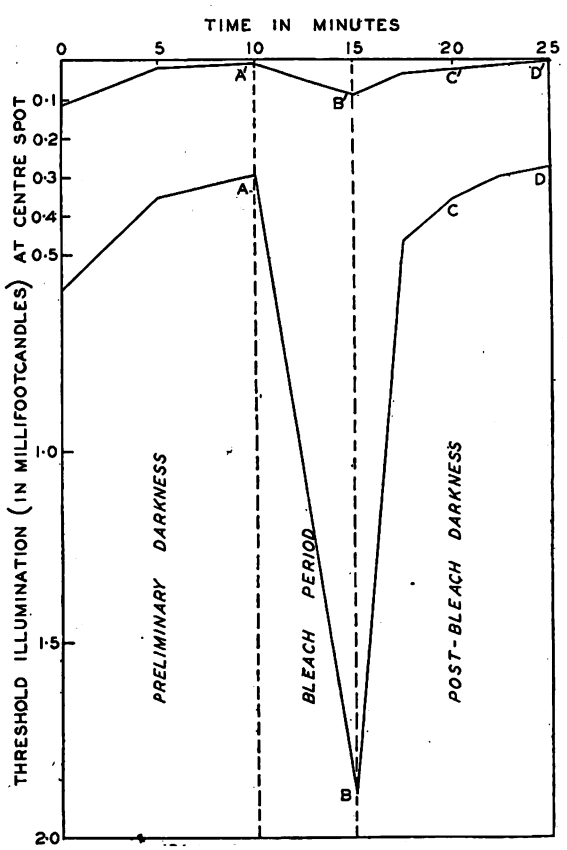

FIG. 2.—Ideal biophotometer curves. Upper curve = good adaptation. Lower curve = poor adaptation.

OBSERVATIONS

A series of observations based on this new technique has been carried out on 80 young women and 22 men, all apparently normal and healthy at the time of testing. No person with defective vision was included. After an interval of seven days duplicate readings were made on 65 of these people. Between tests an arbitrarily chosen group of 34 was given 5000 I.U. of vitamin A each daily, in the form of capsules of a mammalian-liver oil concentrate.

An examination of the individual results (for considerations of space they are not reproduced here) revealed two outstanding points:—

(1) That the post-bleach readings were always related to the pre-bleach readings. This is also apparent in Jeghers's biophotometer graphs, and the implication is that the conditions experienced by the eye immediately before testing are not very important, and consequently that the test might be advantageously confined to a standard bleach followed by, say, ten minutes' darkness. In view of this it was thought justifiable to take the average of the two readings, one at the end of the first ten minutes' darkness, and the other at the end of the five minutes' post-bleach darkness, as an indication of adaptation comparable to that used by Jeghers; for this reason it is called throughout this paper the "Jeghers's index." As an example, the Jeghers's index of the subject represented by the curve in Fig. 2 would be the average of A′ (0·010) and C′ (0·022)—i.e., 0·016. Similarly that of the subject represented by the lower curve would be [A (0·29) + C (0·35)]/$_2$ = 0·32.

(2) That in many case the time values were not correlatable with the Jeghers's indices, although if the

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Jeghers's indices are graded into four groups the *average* time values for each group progressively improve (Fig. 3).

In consequence the distribution of the Jeghers's indices and the time values, together with their alteration after the subjects had taken vitamin A, were examined separately. The former varied from 0·0102 to 0·7720—but figures above 0·4000 must be considered unreliable because of the experimental error discussed previously. For the purpose of analysis all those giving readings less than 0·0830 were classified as normal, and all those more than 0·1840 as subnormal. This gave 50 per cent. of the former and 28 per cent. of the latter. From these two groups all the duplicated readings were collected, divided into "controls" and "vitamins," and the figures averaged (Table I).

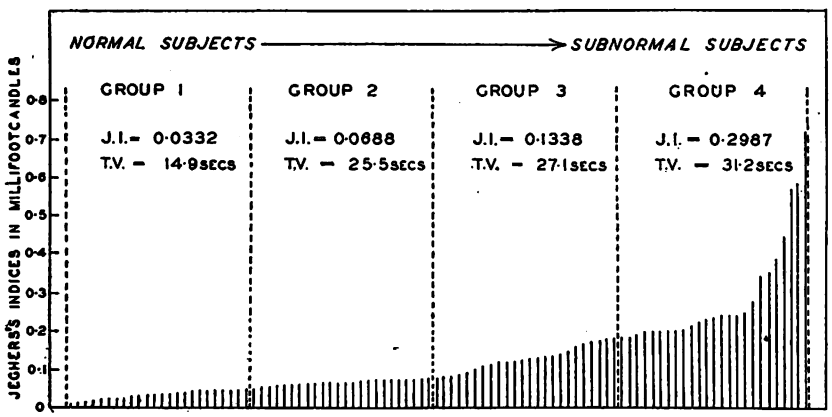

FIG. 3.—The 97 "Jeghers's indices" (J.I.) arranged in order and divided into four groups to show corresponding gradation of average "time values" (T.V.).

These figures are not very impressive; there is an improvement of the subnormals after taking vitamin A, but it is not very great; moreover many individual retests were discrepant.

The figures show the lack of sensitivity of the technique recommended by the makers of the instrument for short-period curative tests. There are indications, however, that the Jeghers's indices do respond to long-period therapy, from which it is concluded that the failure to give an immediate response may only be apparent—the real difficulty being the inaccuracy of the instrument where high illuminations are concerned.

TABLE I

—		No. in group.	Jeghers's indices in mfc.'s. Initially.	After 7 days.
Normals ..	Controls ..	13	0·0439	0·0597
	Vitamins ..	16	0·0602	0·0868
Subnormals	Controls ..	8	0·4093	0·4490
	Vitamins ..	12	0·2376	0·2019

The time values were treated similarly. The range was from 3½ secs. to 74 secs.; 46 per cent. gave values of 23 secs. or less, and 32 per cent. gave values of 30 secs. or more; these were made the normal and subnormal groups respectively (Table II).

It is evident from these figures that night-blindness and its response to vitamin-A medication can be measured in terms of time values. Incidentally the figures show that the "learning factor," at least for this type of reading, is insignificant. Whether this time value is of greater value than the more usual criteria for the assessment of dark-adaptation cannot be ascertained with the biophotometer in its present state, but it is very probably the best method of taking readings with the instrument. It has, too, the advantage of rapidity; each test need occupy only six minutes—five minutes' bleaching followed by a single discernment reading.

Work is being continued and we hope later to publish a more comprehensive report.

SUMMARY

The biophotometer, a new apparatus for the detection and quantitative assessment of hemeralopia, is described. Compactness, ease of manipulation, rigidly standardised testing conditions, and the use of physical units of illumination are noteworthy features. The instrument, which has been extolled by some American investigators and depreciated by others, has one serious, although reparable, defect—viz., an insufficiently sensitive device for controlling test illumination. In place of the prescribed technique, it has been found that to record the time taken by the eyes, immediately after exposure to a bright light, to discern a spot-source of light maintained at fixed illumination, provides a useful criterion of night-blindness and consequently of the adequacy of the vitamin-A supplies of the human body.

As the work here recorded is of a preliminary nature, and in view of the small number of subjects tested, no well-defined conclusions can be drawn. The evidence there is, however, suggests that about 30 per cent. of the people examined are vitamin-A deficient to an extent that is partially, but not fully, alleviated by the administration of 35,000 I.U. over a period of seven days.

TABLE II

—		No. in group.	Time values in seconds. Initially.	After 7 days.
Normals ..	Controls ..	12	14·4	12·1
	Vitamins ..	14	14·8	12·0
Subnormals	Controls ..	10	44·2	45·3
	Vitamins ..	12	44·1	23·8

We wish to express our gratitude to the directors of Messrs. Lever Brothers and Unilever Limited for permission to publish this work.

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MEDICINE AND THE LAW

Unlawful Restraint of Mental Defective

THERE is no need to tell Englishmen that their personal liberty is vindicated by the writ of habeas corpus. If they suffer from any unlawful imprisonment or detention, habeas corpus will give them justice. In the Court of Appeal last week the case of Rex *v.* Board of Control ex parte Winterflood showed this remedy available for a patient who had been detained by an order under the Mental Deficiency Act. He had, as a matter of fact, been released on licence, so that he could not be said to be detained; but the court declared his previous detention to have been unlawful.

Mr. Winterflood had been sent to an institution as a defective under an order which lasted for a year. The order had been continued for another year and again for a further period of five years. But there had been a gap between the date of expiration and the date of continuance. The original order which placed him under restraint for a year was made on June 11th, 1929. A continuance order (for another year) was made on June 23rd, 1930. A further continuance (for five years) was made on June 29th, 1931, purporting to continue the order till June 24th, 1936. On July 6th, 1936, yet another continuance order was made. Did the occurrence of these intervals between the dates of expiration and the dates of renewal invalidate the order? The answer depended on the terms of Section 11 of the Mental Deficiency Act. This section states that the original order will expire at the end of one year unless continued as the Act provides. It goes on to state that the order will remain in force for a further year, and thereafter for successive periods of five years, if, at the date when it would have expired and at the end of each period of one year or five years, the Board examines certain reports, considers that continuance is required in the patient's interests, and makes an order for the purpose. Mr. Winterflood contended that on June 29th, 1931, when one of the continuance orders was made, the previous order (running for a year from June 23rd, 1930) had already expired. Having ceased to have effect, it could not be continued. Consequently, he argued, on and after June 24th, 1930, the Board of Control had no authority to detain him. He asked the High Court to say that he had been unlawfully restrained for several years and to order his immediate release. The case came before the Divisional Court which found no reason for holding that the restraint was unlawful. He then went to the Court of Appeal where he made good his contention. Lord Justice Slesser observed that the language of Section 11 was unambiguous. The order could not be made for more than one year. The right time to make a continuance order was June 23rd, 1931. In the interval between June 23rd and June 29th Mr. Winterflood could have walked out of the institution in which he was detained and nobody could have pointed to any authority under which he could be kept inside the walls. Another point which caused the continuance order to be invalid was that, under Section 11, the Board had to satisfy itself that the continuance was required in the patient's interests before it ordered the continuance; the commissioner had not come to his decision on this point till July 7th, 1931. Mr. Justice Goddard, who concurred, said it might be desirable that mental defectives should be kept in detention after the expiration of an order until a further order was made. But, if so, Parliament must amend the Act; the judges could not override the law. The courts, he added, had always been jealous of the liberty of the subject and had taken a strict and technical view of those cases where persons had been kept in confinement against their will. So now, it seems, the Board of Control must keep an exact time-table of all persons affected by restraint orders and must be careful to see that an order is renewed, if continuance is required, before it expires.

An Inconclusive Medical Certificate

Two points of possible medico-legal interest arise out of Mr. Justice Langton's judgment in the divorce proceedings in Thompson *v.* Thompson, King's Proctor showing cause. One is the uncomfortable suggestion that a report by two gynæcologists upon the condition of a woman named in the proceedings was worthless because she had been impersonated by some other woman at the medical examination. The judge came to the conclusion that so deliberate and daring a fraud upon the court had not been committed. The allegation, however, may make members of the medical profession wonder whether the arrangements for such examinations are entirely proof against a conspiracy to defeat the ends of justice.

The second point was the judge's reminder that a medical finding that a woman is *virgo intacta* is not a final answer to an accusation of adultery. Proof of virginity puts a heavy burden on the party charging a woman with having committed misconduct. But there may be partial intercourse which is sufficient to sustain the charge. If the court is satisfied by other evidence, the medical certificate will not stand in the way. In the Thompson case the judge made a careful statement of the evidence which weighed with him. Amongst other things he was impressed by the fact that the respondent, though not related to the woman and having no business ties or acquaintance with her, possessed a latchkey to her flat. A long-continued association, in circumstances of a highly compromising character, rendered doubly suspicious by the parties' ineffectual denials, was allowed to outweigh what the judge called "the guarded but precise medical certificate." The parties were admittedly on terms of deep affection, slept in the same room together in one house, and almost certainly, he said, slept in the same bed in another house, and they had been at great pains to deceive both the world and the court as to their behaviour. He found that there had been mutual intercourse amounting to adultery in law, in spite of the medical certificate and in spite of the strong presumption in favour of the woman's innocence which the certificate would normally create.

BUDAPEST

(FROM OUR OWN CORRESPONDENT)

WATER, MILK, AND AIR

THE drinking water here is as good as that of any other city in the world according to Dr. Ladislaus Dabis, director of the Public Health and Bacteriological Institute. During 1937 a total of 88,000 samples of water, food, and air have been tested in its various laboratories. Tests have shown that the filtering installation is bacteriologically beyond reproach. Less favourable conditions, however, were found in the suburbs and in the adjacent villages, where there are plenty of wells that are open and insufficiently cared for. The water from these con-

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tained much colon and other bacteria. Still less satisfactory were the reports on the cleanliness of swimming-pools, where the ever-increasing sport renders a rigorous control of hygiene necessary. The bacteriology of the "ice lakes," ice from which is stored for summer use, leaves much to be desired, for they have been found to be seriously contaminated. An order was consequently given that this lake ice must not be used in future, and only that prepared artificially is now allowed. Bottled waters, on the other hand, were found to be very good. The institute took 480 specimens of Danube water. While above the city the number of micro-organisms on either bank is low, below they are naturally much more plentiful and in some parts of the river the water contains 1,440,000 bacteria per c.cm. The daily consumption in Budapest is some 45 gallons a head. The food bacteriological tests were chiefly concerned with the control of milk. It was found that 56·2 per cent. of the pasteurised and 56·7 per cent. of the raw milk was unobjectionable, but only 12 per cent. of raw cream and 55 per cent. pasteurised cream could be called high grade. There was a great improvement in ice-cream; as against 29·8 per cent. of first-class samples in 1936, the figure last year was 54·3. The institute examines all the 14 dairies operating in the capital. Out of these only 6 were found to be unobjectionable and as a rule pasteurisation was grossly imperfect.

The air in the city still has a high gas and sulphur content. In consequence of import restriction there is a shortage in foreign coal and the inferior local coke and coal is used both in factories and in private households. There is still a large amount of dust, but the energetic campaign against this evil—e.g., rebuilding of the roads and increased watering—will certainly bring about a great improvement.

HOSPITAL CONDITIONS IN POLAND

At present there are 700 hospitals in the Polish republic. Of these only 43 are maintained by the State; 313 are supported by municipalities, towns, and villages, 234 by unions, associations, and insurances, and 110 by private persons. The total number of hospital beds amounts to 56,830, out of which 11 per cent. are in the State hospitals, 48 per cent. in the community, 35 per cent. in the association, and 6 per cent. in the private institutions. The Ministry of Social Welfare urges further hospitals to be built, their view being that the proportion of beds to population must be at least 5 per 1000 in the towns and 2 per 1000 in rural districts. The population of Poland, according to the 1931 census, is 31,927,773; out of these 8,679,979 are urban and 23,247,794 are rural inhabitants. Thus there ought to be 43,400 beds for town-dwellers and 46,496 for the country. More than 33,000 beds are therefore needed. For the time being Warsaw alone has the full quota of hospital accommodation, and the counties of Slaski, Posnan, and Cracow have 90 per cent. The rest of the towns and counties have only 10–50 per cent. Conditions are worse in Stanislawow and Tarnopol and in the Eastern counties.

ACTION OF ACETONE ON CANCER CELLS

A young Hungarian physician, Dr. Desider Barna, has made extensive experiments at Prof. Louis Bakay's surgical clinic in studying the division of cancer cells. He fully endorses Haberlandt's conception that in the division of normal cells a hormone plays the principal part, and that it is formed in the dividing cells themselves, being secreted by the chromosomes. He believes that besides the Haberlandt hormone there must be another that inhibits its action, and it is through these hormones that the endocrine glands regulate cell division. At present this inhibiting hormone is unknown, but Barna calls it mitofrenin. Believing that acetone might destroy the cancer cells, he has tested its action on experimental animals. The results, he claims, were very satisfactory, but though the tumours rapidly regressed in every case, the experimental animals themselves died within a short time, also without exception. Barna learnt enough, however, to conclude that cancer cells are more sensitive to the action of acetone than are other cells, and he is conducting further experiments with chemical drugs.

WINE AND THE DEATH-RATE

The consumption of wine in Hungary varies very closely with the death-rate. This is borne out by figures during the five years 1931–35 of men in the age-group 30–59—the period most exposed to the dangers of alcoholic excess. The decrease of wine consumption ran parallel with the decrease of mortality. As shown by the hospital reports, deaths due to chronic alcoholism—cirrhosis, paralysis, circulatory changes—were also decidedly fewer. In years with an especially abundant wine crop, as in 1922–24, the death-rate for that age-group was 12·69 per 1000, while in the next three seasons, when there was a very poor wine harvest, it fell to 9·93 per 1000.

UNITED STATES OF AMERICA

(FROM OUR OWN CORRESPONDENTS)

THE CONTROL OF CANCER

THE twenty-fifth anniversary of the American Society for the Control of Cancer was celebrated at a dinner on March 25th, held at the Ambassador Hotel in New York under the presidency of Dr. C. C. Little. The principal speaker was Dr. James Ewing, director of Memorial Hospital, who outlined for the society a seven-point programme as follows:

1. Wider adoption of periodic physical examinations specifically designed for the detection of cancer.
2. Campaigns directed against specific types of cancer to end the misconception of cancer as a single disease.
3. Scientific, quiet methods of educating the public rather than emotional or vaguely allegorical approaches.
4. Greater emphasis on the different cure rates in the different stages of cancer, showing that delay of even a few weeks may mean the difference between cure and fatal ending.
5. New ways of reaching the non-reading masses.
6. More emphasis on prevention, particularly in internal cancers.
7. A skillfully compiled readable book on cancer for the layman.

Dr. Ewing criticised the modern slogan that cancer is curable. This is true, he said, of only 35 per cent. of the 150,000 who fall ill of cancer each year in this country. Facilities for the early detection of internal cancers are not available. He recommended that the public should be made to realise how variable is the prognosis in different types and stages of the disease and how great is the penalty for delay.

The dinner was followed by a programme broadcast over the "blue network" of the National Broadcasting Company. This included addresses by Surgeon General Thomas Parran, who spoke from Washington, and by Dr. Anna C. Palmer, who was cured of cancer of the breast in 1920 and who is president of the newly formed Cured Cancer Club.

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PRESIDENT SUMMONS HEALTH CONFERENCE

President Roosevelt has written to Miss Josephine Roche, who, though she has resigned as assistant secretary of the Treasury, continues to act as chairman of the Interdepartmental Committee to Co-ordinate Health and Welfare Activities. The President suggests that this committee "give consideration to the desirability of inviting at some appropriate time representatives of the interested public and of the medical and other professions to examine the health problems in all their major aspects, and to discuss ways and means for dealing with these problems." It is understood that Miss Roche plans to include in the invitations representatives of agriculture and of industry as well as of the professions.

SEXUAL ASSAULTS

Last autumn the newspapers took a sudden unusual interest in offences to public safety and morals by persons suffering from sexual abnormalities. The resulting public outcry furnished the stimulus for a series of papers at the twenty-eighth annual meeting of the National Committee for Mental Hygiene. Dr. Edward A. Strecker, professor of psychiatry at the University of Pennsylvania, related that one of the arguments advanced by the Arabs in favour of marriage between first cousins is that in case of a quarrel neither mate will find it expedient to curse the other's ancestors—he would too obviously be cursing his own! The line of demarcation between normal and abnormal in sex is so faint that we shall be wise not to curse too hastily the sex offender. And yet last fall so intolerant was public opinion, stirred by the newspaper headlines, that, in the words of Mr. A. H. McCormick, New York City's Commissioner of Corrections, "it was utterly unsafe to speak to a child on the street unless one was well dressed and well known in the neighbourhood. To try to help a lost child, with tears streaming down its face, to find its way home, would, in some neighbourhoods, cause a mob to form and violence to be threatened." Mr. McCormick believes that sex offenders are mental patients in need of hospitalisation, but there are no hospital facilities available to them in New York City. He therefore does the best that can be done with the penitentiary facilities at Riker's Island. Here some 18,000 sentenced prisoners are received annually of whom about 500 are sentenced for sex offences. The 1938 budget has provided for a psychiatrist and two senior psychologists. "What we can accomplish remains to be seen," he says. "It is one thing to diagnose and another to treat." While New York is lacking in professional advice a nearby State (unnamed) is failing to use the advice that has been made available. Dr. Winifred Overholser, superintendent of St. Elizabeth's Hospital, Washington, D.C., reported that in this State the judge of any court, civil or criminal, may request the department of mental diseases to examine "any person coming before the court," such an examination being made without charge. "Yet in a recent year, when 173,000 criminal cases were started in the district courts and over 37,000 in the superior courts, only 34 requests for examination were addressed to the department."

STUDY OF MEDICAL CARE

I have now seen the eight questionnaire forms distributed to county medical societies by the American Medical Association. Each is entitled "Study of need and supply of medical care." If the words "need and" was omitted the title would be accurate. Each form inquires into a separate source of supply: the private physician's supply, that of the hospital, of the nursing organisations, of the health department, and so on. So much detailed information is called for that, taking into account the very variable enthusiasm and competence of the investigators and the great variation of the types of provision of care in different parts of the country, it is difficult to believe that this well-meant effort will produce statistics of value. At any rate the statistics produced can only measure the present provision of medical care. The inquiry takes no account of those who do not seek medical care. The great bulk of those who need medical care do not seek it either because they do not know where to seek it, or because it is not available to them, or because they are not themselves cognisant of need. No one can enumerate these individuals. Their number can be estimated best by such house-to-house canvassers as that conducted by W.P.A. workers in the recent nation-wide survey.

THROMBOCYTOPENIA

Observations by C. E. Troland and F. C. Lee, published in the *Bulletin of the Johns Hopkins Hospital* for January, establish a scientific basis for splenectomy in persistent thrombocytopenia and open the way to new studies which may abolish the use of the term "idiopathic" in such cases. They found that a substance contained in the spleens from cases of thrombocytopenic purpura had the property of reducing the platelet count in the circulating blood of normal rabbits by as much as 90 per cent. The as yet chemically unidentified substance for which the authors suggest the term "thrombocytopen" was obtained from three cases. When 20 c.cm. of the extract obtained from the first case was injected into the ear vein of a rabbit the platelet count was reduced in twenty-four hours from 620,000 per c.mm. of blood to 58,000, with return to normal in thirty-six hours, and bleeding-time was prolonged at the height of the reduction in platelets. The extract from the second case produced a platelet drop from 640,000 to 20,000 in twenty-four hours, and from the third from 610,000 to 100,000 in the same length of time. These results were noted from the injection of 20 c.cm., but it was found later that 5 or even 3 c.cm. would produce almost as much thrombocytopenia as the larger amounts. Repeated injections caused a constant count of about 70,000 for about nine days, while continued administration (there were only about four injections given) might have maintained this low count longer.

The method of preparation was as follows. The spleens were taken directly from the operating-room, ground in a food-chopper, and placed in a rubber-sealed jar with twice the volume of reagent acetone. The jar was shaken occasionally for several days, and after about two weeks the supernatant fluid was filtered away, the acetone distilled off, and 100 c.cm. of distilled water added to the small amount of thick brownish material which had been deposited on the walls of the distilling flask. This was shaken vigorously. It was noted that the filtrate, yellowish-brown and cloudy, did not show a precipitate after standing in the ice-box for weeks. Four control extracts were made in a similar manner from thyroid tissue, myomatous uterus, a spleen from a patient with Banti's disease, and a spleen from a case of hæmolytic jaundice. Virtually no decrease in the number of platelets was noted after the injection of any of these control extracts.

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IRELAND

(FROM OUR OWN CORRESPONDENT)

SUGGESTED WHOLE-TIME DISPENSARY MEDICAL SERVICE

EVER since the establishment of the dispensary service in Ireland in the middle of the last century the service has been carried on by part-time medical officers. In country areas it would have been impossible to carry it on otherwise. The expenses of salaries on a whole-time basis would have been greater than the ratepayers would have tolerated, and, on the other hand, if the dispensary medical officers had been debarred from private practice the public, apart from those entitled to free medical attendance, would have been deprived of access to any medical practitioner. In the larger cities the case has been otherwise. There has been no scarcity of private practitioners, and in present-day conditions the dispensary officers are so overworked that they have little time to spare from their official duties to devote to private practice. The remedy would be to appoint a larger number of dispensary doctors. It has been found, both in town and country, that the stimulus of the prospect of private practice has attracted men to the dispensary service who would not otherwise have sought it. Moreover, the reputation gained by a medical man in his public duties has often formed the foundation of a sound private practice. The dispensary medical officers of some of the larger centres of population have recently been disturbed by rumours that they are to be displaced in order to establish a whole-time service in such areas. Both in Dublin and Cork such proposals have been put forward by members of the local authorities, but so far have not gained any substantial support. It is stated, however, on apparently good authority, that the commissioner in charge of local affairs in Limerick is about to abolish the several dispensary districts in his area, terminating the terms of office of the medical officers, and to appoint a small number of whole-time officers in their place. Moreover, it is stated that his proposals are likely to be approved by the Department of Local Government and Public Health. Medical opinion is certainly hostile to such a development. It is held that a limited whole-time medical service in a small area is not likely to attract a suitable class of candidates. It would offer no prospects of promotion and no outlet, and so far from being a useful training for private practice the routine work would be detrimental to the development of capacity for private practice. The work would be exacting in time and labour, and would leave no leisure for self-improvement. In fact, one could hardly expect that the posts would attract any but quite young men devoid of ambition but compelled by poverty. If, as many medical men consider, the poor-law medical service should be replaced by a State service, it should be done on a definite comprehensive plan and not piecemeal. Moreover, most of those who have advocated a State medical service for Ireland have contemplated a part-time and not a whole-time service.

CHIEF VETERINARY OFFICER.—Mr. D. A. E. Cabot, senior deputy chief veterinary officer, has been appointed to be chief veterinary officer in succession to Sir John Kelland, who retires on June 1st.

RESEARCH IN SURGERY AT EDINBURGH

A UNIT for clinical research in surgery has been established at Edinburgh by the Medical Research Council, acting jointly with the Royal Infirmary, the University, and the Royal Hospital for Sick Children. The unit will be located in the infirmary, with facilities also in the university department of surgery and at the hospital. The director is Mr. W. C. Wilson, F.R.C.S.E., who has for this purpose been appointed to the whole-time staff of the council. The arrangement has at present been made for a period of five years, from April 1st, 1938.

Mr. Wilson graduated in medicine at the University of Edinburgh in 1924, and three years later became a fellow of the Royal College of Surgeons of Edinburgh. He held a Carnegie research fellowship at the university and later was awarded a Rockefeller travelling fellowship. After a period as assistant surgeon at the Deaconess Hospital, Edinburgh, he was appointed to the staff of the Royal Hospital for Sick Children, first as assistant surgeon and later as surgeon. At the university Mr. Wilson is at present lecturer in applied physiology and child life and health. In 1929 the Medical Research Council published his report on the tannic acid treatment of burns in their special report series, and in 1933 he was one of the committee who reported to the Mines Department on the medical treatment of men burned in colliery explosions. He has also written on the occlusion of blood-vessels and on sweat secretion.

The establishment of "units" or departments of this kind in selected hospitals forms part of a policy adopted by the Medical Research Council for the promotion of research work in clinical science, as opposed to the laboratory branches of medicine. Two units for research in clinical medicine, and one for research in neurology, have already been established in London. The new surgical unit is the first one under the scheme to be set up outside the metropolis.

THE LANCET 100 YEARS AGO

April 14th, 1838, p. 74.

From a lecture on fermentation delivered by Dr. G. G. SIGMOND *at the Windmill-street school of medicine.*

. . . Jem Sheed, the founder of Persepolis, has, amongst the antiquarians, now carried away the honour of being considered the inventor of wine. The Persian writers say, that being fond of the grape he was desirous of preserving some of a fine quality, and that he ordered them to be placed in a vault, in a large vessel, for future use; in this situation the process of fermentation went forward, but their juice having been tasted was found immature, and supposed to be poisonous, and the word poison was accordingly affixed upon the vessel containing it. His favourite sultana was affected with a nervous headache which so overpowered her that she determined on suicide, and for this purpose swallowed some of the suspected liquid; she drank so much of this, which had now become wine, that after undergoing some pleasing sensations from its effects, she fell asleep, and was so much satisfied with the experiment that she had made, that she had recourse to this remedy until the whole of the poison was drank. The monarch, however, from some circumstances, was led to make inquiries, and the lady having confessed what she had done, taught him to follow her example upon another occasion; the whole court was delighted with the experiment, and to this day Tehere Kooshon, the delightful poison, is as much sought after as it is elsewhere.

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GRAINS AND SCRUPLES

Under this heading appear week by week the unfettered thoughts of doctors in various occupations. Each contributor is responsible for the section for a month; his name can be seen later in the half-yearly index

FROM A CONSULTING PHYSICIAN

III

Mr. Somerset Maugham recently wrote "I do not know a better training for a writer than to spend some years in the medical profession" and added of his hospital experiences "Here I was in contact with what I most wanted, life in the raw." There is truth in this, and I think that despite everything we are left with a more favourable impression of human nature than, say, the lawyer or the stock-broker. In his "Summing Up" Mr. Maugham states: "I have no desire to lay bare my heart and I put limits to the intimacy that I wish the reader to enter upon with me." Therein he differs from Sir James Barrie, whose autobiographical "Greenwood Hat" is almost shy-making in its self-revelation. I know that this attitude revolts some readers, but there is much of medico-psychological interest to be gathered from it. Thus he told us he was naturally left-handed but learned to write with his right, until he contracted writer's cramp and had to educate his left hand. He went on to say "I write things with the left, or to put the matter I think more correctly, it writes things with me, that the right would have expressed more humanely. I never, so far as I can remember, wrote uncomfortable tales like 'Dear Brutus' and 'Mary Rose' till I crossed over to my other hand. I could not have written these, as they are, with my right hand any more than I could have written 'Quality Street' with my left." Evidently his readers are much indebted to his writer's cramp! Now some authorities regard this disability as a revolt of the unconscious. I saw a patient whose cramp first developed over writing cheques for his wife, a process he had good cause to dislike cordially. Barrie's right hand perhaps refused to go on "writing with him" things which were plastered over with a deliberate sentimentality and not true to his deeper self. Being congenitally left-handed he acquired the power of writing that way late in life with comparative ease, and a rich outpouring from the unconscious was released through the more primitive route. For to me the chief attraction of Barrie's work is the frequent employment of primitive imagery. Many primitive races regard a man's shadow as his soul; Peter Pan was distressed at losing his shadow, and it was his mother-substitute Wendy who restored it to him. The symbolic significance of the taking away of the knife by the ghost of Mary Rose from her son is abundantly clear. Mr. Bosanquet has suggested that the tendency of boys at a certain age to build shelters in trees is a reversion to the arboreal state of men; Peter Pan places the Wendy House on the tree tops in Kensington Gardens. Mary Rose hid in the apple tree, her son escaped from home by it, her father cut it down; here again the symbolism is clear for that apple tree first appeared in the human drama in the Garden of Eden.

I only met Barrie once; he was pleased that my wife had divined that Lob was Peter Pan grown old. Otherwise conversation languished, though not so completely as on the occasion when he sat next to A. E. Housman at dinner and they never exchanged a word. He told me they exchanged letters next day however.

Barrie wrote:—

> Dear Professor Houseman,
> I am sorry about last night, when I sat next to you and did not say a word. You must have thought I was a very rude man; I am really a very shy man.
> Sincerely yours,
> J. M. Barrie.

Swiftly came the reply:—

> Dear Sir James Barrie,
> I am sorry about last night, when I sat next to you and did not say a word. You must have thought I was a very rude man; I am really a very shy man.
> Sincerely yours,
> A. E. Housman.
>
> PS.—And now you've made it worse for you have spelt my name wrong.

* * *

Housman was indeed an enigmatic and somewhat alarming figure. He seemed to hate any reference to "The Shropshire Lad" and preferred to base his claim to fame on the skill with which he brought all the heavy artillery of scholarship to bear on his edition of Manilius, a poet who otherwise would have been deservedly forgotten. Authors are often extraordinarily incapable of appreciating their earlier work in their later life. George Moore told me that he was spending his old age pulling up weeds, by which he meant that he was drastically revising the novels he had written more than thirty years before. I ventured to suggest to him that he was pulling up some flowers as well, since he had expunged from the final version all the passages I remembered best in "Evelyn Innes." To which he replied that it was a rotten book anyhow! Well, perhaps as the flame of life dies down, some of the imaginative fire which inspired the author as a young man does seem frankly ridiculous to him. What a pother about nothing, he thinks—but style, now *that* remains; *that* is worth striving for. And so he flattens out his story, until the monotonous perfection of his "style" spreads over it like the delta of a river approaching its end. How different from the torrent that poured out all sparkling at its source.

* * *

For those who dislike Barrie's sentimental attitude towards his childhood, Frank Kendon's "The Small Years" will be found refreshing. How true is his remark "The people who lived round about us were all part of the spectacle of life, . . . and during the long eternity of childhood they seemed to remain unchanged." And then one of them dies and the old sense of permanence, of security is gone for ever. He says of his grandfather's death "He was as a sun in the little world we knew, and I could not see a world at all without him."

Particularly striking is his description of the way that the contrast between life and death became real and tragic through the killing of a wren by throwing a stone at it. "Its eyes were shut, its beak was caught in the act of crying, death took it in the middle of a breath; and certainly it was dead—still, small, harmless—and brotherly we suddenly saw. There was a pain at the back of my mind, as though something shameful had been done."

I once told this story to a group of three men—one a canon, the second a judge, the third a solicitor;

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Each of them remembered a similar incident in their own boyhood; so did I. The fact that such an incident should have impressed itself on the mind of each of us all those years after is in itself significant. Pointless cruelty may up to a certain stage be merely the thoughtless expression of primitive savagery—an atavistic throwback. But once it is felt to be wrong, a decisive moment in a boy's life has been reached, and much depends on the way he reacts to it. If he persists in such actions after this flash of illumination, the vestigial savage is on the way to become a potential sadist. It is of great importance to the future of mankind that the tendency of this strain of savage enjoyment of cruelty to persist should be realised. It was strikingly demonstrated in the reaction to the sentences inflicted in a recent case. Whether the true ends of justice are served by corporal punishment or not is a debatable matter, but the eagerness with which two entirely different accounts of that punishment were read in the columns of two newspapers under the same proprietorship showed that on the public the effect was undoubtedly evil.

CORRESPONDENCE

THE HÆMOLYTIC SYNDROMES

To the Editor of THE LANCET

SIR,—The excellent editorial in your issue of Feb. 26th refers to our work on "the presence of hemolysins in acute hemolytic anæmia" [1] and to other papers relating to varied phases of the problem. The immediate occasion for your article was the appearance in the same issue of a contribution by Dacie, Israëls, and Wilkinson on paroxysmal nocturnal hæmoglobinuria of the Marchiafava type. May we be allowed a few words of comment regarding our views on the hæmolytic syndromes and their interrelationships?

Our recent interest in the subject of the hæmolytic syndromes arose from the demonstration of very active isohæmolysins in 3 cases of acute hæmolytic anæmia. These hæmolysins were active in a wide temperature range, but their activity could be suppressed by heat (56° C.) and by previous mixture with normal human serum. Cells of all blood groups, including those of Group O, were hæmolysed. Addition of complement resulted in reactivation of heat-inactivated serum. Contrary to your editorial statement in this regard, the effects of changes in *p*H were not studied. The fact that normal human serum could inactivate hæmolysis in vitro caused us to speculate regarding a possible antilysin present in normal serum, thus accounting for the efficacy of the transfusion of even a small quantity of blood in some of the clinical cases. Josephs,[2] as you point out, demonstrated that normal serum possessed an inhibitory power upon hæmolytic activity and used serum concentrates in certain cases of hæmolytic anæmia.

On the basis of our studies with clinical material, together with our more recent experimental work, we are rapidly coming to feel that all of the hæmolytic syndromes, of which there are many, are due to the activity of hæmolysins, whether or not these are demonstrable in the blood-serum. As pointed out by Chauffard and Vincent many years ago (1909) and neglected by most observers, the difference between acute hæmoglobinuria and acute hæmolytic anæmia (icterus) is one of degree and probably a function of the amount of hæmolysin present. Our discovery of an hæmolysin was in reality a rediscovery (the literature abounds with them), since Chauffard with Troisier [3] and Chauffard and Vincent [4] found similar hæmolysins in their cases and proposed the term "hæmolysinic icterus." Much of the work of Widal, Abrami, and Brulé [5] on acquired hæmolytic icterus also seems to have been forgotten. At present we classify the hæmolytic syndromes in this fashion:—

Fulminating.—Acute paroxysmal hæmoglobinuria—"cold type" (Donath-Landsteiner).
Paroxysmal nocturnal hæmoglobinuria.

Acute.—Acute hæmolytic anæmia (or icterus)—often associated with hæmoglobinuria.
Subacute hæmolytic anæmia (same as acquired hæmolytic icterus, hæmolytic splenomegaly—Banti[6]).

Chronic.—Acquired type.
Congenital type.

Since hæmoglobinuria may occur when hæmolysis is unusually rapid, a number of cases of acute hæmolytic anæmia have been classified under the hæmoglobinurias, as for example that of Chauffard and Vincent (1909) [4] and Castex, Steingart, and Poletti (1932).[7] One of these (Chauffard and Vincent) has been quoted by Dacie et al. as belonging in the group of paroxysmal nocturnal hæmoglobinuria. They state that the only serological finding in Chauffard and Vincent's case was "slight autolysis in venous blood." This is contrary to the actual data which show that Chauffard and Vincent made extensive studies of the serum hæmolysins and demonstrated their complete identity with the lysins which were then under intensive study by various immunologists (Bordet, Ehrlich, and Morgenroth, and others). The case of Salén,[8] which is quoted by Dacie et al., does not appear to be of the nocturnal variety, and since hæmoglobinuria occurred chiefly with cold, it more closely resembled the paroxysmal (cold) type.

Donath and Landsteiner [9] demonstrated that certain cases of paroxysmal hæmoglobinuria were associated with the presence of a lysin active only at low temperatures. Our own lysin is active at various temperatures and is relatively thermostabile. The lysin demonstrated in the case of Dacie et al. is thermolabile and is affected greatly by changes in *p*H, as also pointed out by Ham.[10] These two groups of investigators conclude that the disorder of paroxysmal nocturnal hæmoglobinuria resides in an abnormality of the cells. It is possible, however, that the abnormality of the cells is conditioned by the activity of a lysin which might have caused the cells to become "sensitised" and thus more readily susceptible to hæmolysis. Some of the discrepancies alluded to by Dacie et al. might be due to activity of lysin rather than to cellular abnormality. It is possible that various types of hæmolysins are present in various clinical conditions, and already four have been demonstrated: acute paroxysmal ("cold") hæmoglobinuria, associated with a "cold" hæmolysin; paroxysmal nocturnal hæmoglobinuria (heat-

[1] Dameshek, W., and Schwartz, S. O., *New Engl. J. Med.* 1938, 218, 75.
[2] Josephs, H. W., *Bull. Johns Hopk. Hosp.* 1938, 62, 25, 53.
[3] Chauffard, A., and Troisier, J., *Bull. Soc. méd. Hôp. Paris*, 1908, 26, 94.
[4] Chauffard, A., and Vincent, C., *Sem. méd.* 1909, 29, 601.
[5] Widal, F., Abrami, P., and Brulé, M., *Arch. Mal. Cœur*, 1908, 1, 193.
[6] Banti, G., *Sem. méd.* 1913, 33, 313.
[7] Castex, M. R., Steingart, M., and Poletti, R., *Sang*, 1932, 6, 589.
[8] Salén, E. B., *Acta med. scand.* 1927, 66, 566; 1935, 86, 570.
[9] Donath, J., and Landsteiner, K., *Münch. med. Wschr.* 1902, 51, 1590.
[10] Ham, T. H., *New Engl. J. Med.* 1937, 217, 915.

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labile, *p*H-labile hæmolysin); paroxysmal hæmoglobinuria, Salén (thermostabile? "cold" hæmolysin, complement not required); acute hæmolytic anæmia (hæmolysin thermostabile, complement required).

In two of our cases of acute hæmolytic anæmia, the blood picture superficially resembled that of pernicious anæmia; in the third one, the outstanding features were microspherocytosis and increased fragility, as in congenital hæmolytic jaundice. We felt that the abnormal blood picture might be due to the hæmolysin, since with recovery and gradual disappearance of hæmolysin the blood picture became normal. Our experimental studies with acute hæmolytic anæmia bear out our original conception that microspherocytosis and increased fragility may be due to the activity of a hæmolytic agent rather than to a fundamental abnormality of cellular production in the marrow.

We feel that the result of all this recent work, as quoted by THE LANCET, has been to reopen the entire subject of the hæmolytic syndromes. These were rather thoroughly explored by the French between 1900 and 1914, and later by the Italians. From 1926 to the present, the investigations in pernicious anæmia and more recently in hypochromic anæmia became so absorbing, however, that the hæmolytic syndromes were almost forgotten. May THE LANCET continue to record the forthcoming advances.

We are, Sir, yours faithfully,

WILLIAM DAMESHEK,
STEVEN O. SCHWARTZ.

Boston, Massachusetts, March 24th.

OXYGEN-WANT AND ITS ALLEVIATION

To the Editor of THE LANCET

SIR,—Although a large proportion of patients obtain relief from oxygen-want by means of oxygen and carbon dioxide therapy there is still much room for improvement. This leads to the consideration of other means of relief—for example, whether there may be some substance or enzyme which could be administered to aid oxidation in the cells when these are exposed to oxygen pressures lower than the normal.

During the past six months I have directed attention to the search for such a substance. I have tested, *in vivo*, most of the usual hormones, vitamins, and drugs, including cardiac stimulants. None of these seem to give any very definite aid during exposure to severe degrees of acute oxygen-want. The experiments have been carried out in a small decompression chamber at the premises of Messrs. Siebe, Gorman and Co., S.E.1, to whom I am indebted for facilities. White rats weighing about 80–100 g. have been exposed fairly suddenly to barometric pressure 250 mm. Hg, or one third of the normal (oxygen pressure about 7 per cent. atmosphere), for about 35 minutes. When the surrounding temperature is kept at 24° C. all the rats usually survive the exposure and these conditions are used to test for substances which enhance oxygen-want. When the surrounding temperature is raised to 33° C. the rats cannot as a rule tolerate such a degree of oxygen-want for more than about 10 minutes. These conditions are therefore used to test for substances which increase powers of resistance to low oxygen pressure.

So far the only condition which enables white rats to tolerate 7 per cent. of oxygen for 30 minutes at 33° C. and survive is previous feeding for 3–5 days on a diet consisting wholly of raw carrots. The active substance is not vitamin A; nor does it appear to be carbohydrate since rats fed on a grain diet are not resistant. Starvation for a day or two has no relieving effect, and the usual means recommended to antagonise tissue oxygen-want—namely, ammonium chloride and carbon dioxide—are of little value under the above conditions compared with the diet of carrots. Experiments are in hand to isolate any active substance which may be present and act as a detoxicating agent for the liver, heart, brain, and other organs, or which may be of the nature of a peroxidase or other enzyme.

I am, Sir, yours faithfully,

J. ARGYLL CAMPBELL.

National Institute for Medical Research, N.W., April 6th.

HEARING-AIDS FOR DEAFNESS

To the Editor of THE LANCET

SIR,—Neither of your correspondents has made any allusion to two points of importance that must be taken into consideration when advising any form of hearing-aid to a patient. One concerns a necessary precaution connected with its use, the other with its source.

The permanent use of an aid slowly but surely increases the deafness, because every aid acts by collecting, carrying, and magnifying sounds. This causes the ears to become "lazy," and the important listening function is thus thrown into abeyance. Consequently a time comes when the patient finds himself obliged to obtain stronger aids. Indeed, one French writer has envisaged a patient finally going about accompanied by a wheel-barrow full of batteries. As a consequence of this impairment of the listening function, it is imperative to prevent it by insisting that all patients using aids should carry out twice daily some form of listening exercise. Such exercises are comparable with voluntary movements during the recovery of a limb which is already receiving passive exercises.

My second point is that it is the duty of the aurist to ensure that his patient goes to an honest firm for his aid. Some surgical instrument makers now have special departments under competent experts for hearing-aids. These coöperate loyally with the surgeon and do not charge extra fees for trial. There are, on the other hand, certain commercial firms who advertise continuously and flamboyantly in the daily press and whose sole object is to exploit the deaf public for all it is worth. Their prices are exorbitant and they charge fees for trial which are not allowed for when a purchase is made. These firms do not worry about decibels, possibly because they have not yet heard of them.

I am, Sir, yours faithfully,

MACLEOD YEARSLEY.

Wimpole-street, W., April 9th.

"OUR COLLEAGUES IN AUSTRIA"

To the Editor of THE LANCET

SIR,—I should like to express most heartily my agreement with the common-sense protest made by Mr. Goodwin and Dr. Endean against the policy of encouraging Jewish emigrés from Middle Europe to practise in this country. The medical profession is now very overcrowded and often for one vacant appointment there may be as many as thirty candidates, all of whom may be excellent men who would fill the job admirably. Under such circumstances how can it ever be "conclusively shown" (Prof. Samson Wright) "that the applicant's (for permission to practise) special knowledge and experience would be of benefit to the profession as a whole?" It might be pertinent to inquire whether other pro-

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fessions are suggesting the same policy, and whether lawyers, engineers, civil servants, and so forth in this country are welcoming fresh competition in the shape of Jewish refugees from Middle Europe; or is ours the only profession encouraging this misplaced philanthropy?

I am, Sir, yours faithfully,

Cardiff, April 9th. A. C. LYSAGHT.

To the Editor of THE LANCET

SIR,—I, like those others who have written to you, feel the strongest possible sympathy for those who have been forced to leave Austria for racial or political reasons and would like to see them safely installed where they are unlikely to be subjected to further persecution. Nevertheless I cannot agree that we should have a further number allowed to settle in England—even if they are not admitted to the Register. These people are, in most cases, not of independent means and sooner or later they are going to ask to be allowed to practise. There is no doubt that our profession is greatly overcrowded now, and, even in some years, to allow a further number of doctors to practise in England will inevitably lead to hardship. If this occurs it will undoubtedly breed further antisemiticism in England as it has in Arabia.

It may be said that by giving the refugees research grants it is possible for them to do work which is beneficial without interfering with those already established here. This I do not think is true. At the time when the Jewish doctors were first ejected from Germany I was applying for research grants and found it impossible to obtain one. Shortly afterward I found that a large number—I believe eleven—German refugees had research grants in a hospital which I visited. It does not embitter me that I should have made a sacrifice of a grant which I may have obtained otherwise to aid some poor refugee, but I feel that we should not be the only country to make sacrifices. It is not surprising to me that those who signed the original letter to you were all established and need not fear "foreign" competition.

Are there no countries which have a large population but relatively few doctors? Is there no place for the refugees in India or South America for instance? I would suggest that if the well-meaning folk who would import further competition for the medical men here do not want to raise a new wave of antisemiticism it were better for them to consider the proposition of sending the refugees elsewhere.

I am, Sir, yours faithfully,

London, April 11th. M.D., M.R.C.P.

INSULIN SHOCK IN PSYCHIATRY

To the Editor of THE LANCET

SIR,—I feel that your leading article of April 2nd does not do full justice to the part played by Dr. Sakel in originating the above therapy. Although others before him had been using insulin in psychiatry, the therapy did not exist as such when he introduced it in 1933. His claim, therefore, is a greater one than merely having forced the method to its furthest conclusion. It was Sakel who recognised the therapeutic possibilities of the hypoglycæmic state, and evolved a safe method of producing it. As for Pötzl himself having said that the method introduced by Sakel in his clinic at Vienna was the audacious continuation of earlier work, I respectfully submit that the reference in the original article does not imply that meaning.

I am, Sir, yours faithfully,

H. PULLAR STRECKER.

Harley-street, W., April 9th.

*** It is possible to consider Dr. Sakel in his historical setting without disputing his merits as originator of the method now employed. Slotopolsky-Dukor's article states the matter clearly. Prof. Pötzl, in the article referred to, said of Dr. Pascal's book published in 1926: "...hier sind neben vielen anderen Methoden auch Insulinshocks erwähnt, allerdings ohne dass die Methode an einem grossen Krankengut verfolgt und ausgearbeitet worden wäre" and later: "Ich habe diese längere Einleitung vorausgeschickt, weil ich dartun wollte, dass eine Shockbehandlung der Schizophrenie, wenn man so sagen darf, ein alter Gedankengang war, der nur fortgedacht werden musste. In der Durchführung dieses Gedankens, wie die Insulinshockmethode sie enthält. . . ."—ED. L.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED APRIL 2ND, 1938

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 2323; diphtheria, 1388; enteric fever, 8 (20 "expected"); pneumonia (primary or influenzal), 1205; puerperal pyrexia, 198; cerebro-spinal fever, 32; acute poliomyelitis, 4; acute polio-encephalitis, 3; encephalitis lethargica, 13; dysentery, 111; ophthalmia neonatorum, 105. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on April 8th was 5596, which included: Scarlet fever, 843; diphtheria, 1160 (carriers 51); measles, 2241; whooping-cough, 291; puerperal fever, 14 mothers (plus 8 babies); encephalitis lethargica, 281; poliomyelitis, 1. At St. Margaret's Hospital there were 22 babies (plus 9 mothers) with ophthalmia neonatorum.

Deaths.—In 125 great towns, including London, there was no death from small-pox or enteric fever, 38 (12) from measles, 5 (0) from scarlet fever, 28 (4) from whooping-cough, 25 (5) from diphtheria, 33 (14) from diarrhœa and enteritis under two years, and 74 (13) from influenza. The figures in parentheses are those for London itself.

Measles was fatal in 19 great towns; Manchester reported 4 deaths, Liverpool 3. Whooping-cough was responsible for 4 deaths in Liverpool, 3 in Birkenhead and Hull. Diphtheria was fatal in 17 great towns, Liverpool reporting 3 deaths.

The number of stillbirths notified during the week was 290 (corresponding to a rate of 41 per 1000 total births), including 42 in London.

PROVISIONAL DEATH-RATES

Provisional death-rates per million population for England and Wales during the year 1937 as follows have been issued by the Registrar-General:—

—	Males.	Females.	Persons.
Respiratory tuberculosis ..	702	475	584
Other tuberculosis	122	101	111
Cancer	1633	1631	1632

The maternal mortality (provisional) based on deaths primarily classed to puerperal conditions is as follows:—

Puerperal sepsis	per 1000 live births ..	0·97
	,, ,, total ,, ..	0·94
Other accidents and diseases of pregnancy and parturition	,, ,, live ,, ..	2·26
	,, ,, total ,, ..	2·17

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A MOBILE LABORATORY IN SPAIN

WE have received a further letter from Dr. R. S. SAXTON, a member of the British ambulance unit of the Spanish Medical Aid Committee.

For work on the Aragon front, he writes, the travelling laboratory has been planned and executed with the help of my two assistants under very considerable difficulties of finance and material, and though its form has been with us for four months its equipment has been sadly lacking until quite recently.

Starting with a large Ford ambulance whose body had been destroyed but whose chassis and engine were good, we obtained the services of a coach-builder who made us a suitable body. This contained a work table, various cupboards, shelves, drawers, &c., which have since been increased in number and altered, as need has arisen, by local carpenters. Spaces were left in the four corners for the larger instruments and are now occupied by the refrigerator, autoclave, dry-heat steriliser, and incubator. A small sleeping compartment with three bunks was built in between the driving seat and the laboratory proper, and a 50–60-gallon tank for water was fixed on the roof with suitable connexions within. The whole was wired so that it could be plugged into the local electrical supply wherever it might be. Having the framework we had to begin filling it, and this was a long and difficult process. We started with little more than an old-fashioned microscope, a centrifuge, a certain amount of glassware, and a few reagents. The two laboratory workers, an American and an Italian, were both eager to do what was possible with the material available and to acquire more equipment. So the work began four months ago, and, bit by bit, we have been able to cull from various sources a great deal of the required material, and have been able to undertake practically every kind of laboratory examination that is required anywhere near the front.

The work that we hope to do should be of considerable general interest if we can really make an effective study, similar to that of Yudin (*Lancet*, 1937, **2**, 361), on cadaver blood and its use in transfusions. The work done so far by the laboratory includes the following: urines (chemistry, bacteriology, and cytology), diazo reactions; blood (parasitology, hæmoglobin, blood counts, and differential counts), sedimentation-rates, Widal, Meinicke, and Kahn reactions; urethral smears for gonococci; smears for chancres; sputum for T.B. and for pneumococci; throat swabs; water analyses (*B. coli*); fæces for occult blood and for parasites. Naturally the work has not been continuous; for we are a mobile hospital unit, and the more complicated examinations were quite impossible in the earlier days, but as can be seen from the list quite a variety of work has been done. The most obvious difficulty has been the lack, even yet, of certain small but essential articles of equipment, such as a water still—distilled water being very hard to obtain—and glass for making pipettes. We have a weighing machine, for instance, without weights, and have to use it very inaccurately, weighing with measured volumes of water! Another difficulty nearly all of us experience is to concentrate on work when there is aviation intent on our destruction flying over our heads at distressingly frequent intervals. This applies more particularly to laboratory work, so much of which has to be accurate and requires careful observation. We are disappointed, too, in the complete lack of assistance that has come to us, for this work, from abroad, considering that each of us, I and the two assistants, comes from a centre of medical aid for Republican Spain. The American comes from Los Angeles, the Italian has worked in Parisian laboratories for the last two years before coming here, and I came out under the auspices of the Spanish Medical Aid Committee.[1] Requests to these three sources have been fruitless, possibly for lack of available funds.

[1] 24, New Oxford-street, London, W.

The acquisition of material was therefore very slow. In fact the only way in which we could get what we have was by begging from those who had an excess or buying in towns, until we were able to salvage from a hygiene institute in Teruel a great deal of material that at any moment was liable to be destroyed by enemy artillery. We are still short of a few small instruments and reagents, but these will be no great problem to acquire here or in London or Paris, for we have all the major and expensive apparatus we need.

One interesting problem remains, however, and that is the question of fuel. The sterilising instruments are heated by petrol stoves, and the bunsen uses alcohol, and there is seldom any difficulty there; but the refrigerator, incubator, and centrifuge run on the usual Spanish mains at 125 volts alternating. This would be satisfactory enough if one could always count on the electrical supply. The closer one is to the front, however, the more seldom is electric current available. So the next step for which we are negotiating is to exchange or alter the refrigerator so as to use butane, cylinders of which are available, and to find some alternative fuel for the incubator. A hand centrifuge is already available.

My own interest in the travelling laboratory arose from the need for laboratory control close to the front if I were to follow up and develop into something of practical use to our surgical units Yudin's work on cadaver blood transfusions. Already we have been able to confirm that no anticoagulant is necessary to keep liquid the blood from the usual violent war casualty (*Lancet*, March 19th, p. 695), and the technique of collecting the blood has not caused difficulties, except in so far as there is a shortage of suitable bottles in which to store the blood, and of rubber bungs. Before actually using such blood, however, it is essential to submit it to a bacteriological, cytological, and serological examination, and so the laboratory must always be on the spot. The lack of a functioning refrigerator has prevented us from storing blood for long, and often we have been obliged to fall back on direct transfusions. This is an unwarranted strain on our staff, most of whom have already given at least once, and who, in any case, are usually working pretty hard when there are many wounded. Sometimes we have managed to obtain donors from a village in which we have been stationed. But much time is lost and enough is seldom obtainable; for it must be borne in mind that the type of case we treat has a very severe war wound, and a litre of blood is a small transfusion and in fact often insufficient.

The laboratory then, as far as the surgical units are concerned, is just one further step in the improvement of the blood transfusion service. The next step will be the establishment of a shock ward where will be kept together all special cases requiring transfusions, and where we hope to have always available stocks of stored blood and salines—especially one that experience has proved particularly effective, which the laboratory will be able to put up for me, 30 per cent. glucose with 1 unit of insulin per 3 grammes of glucose. Here, too, we hope to have the necessary equipment and skill, to give to those who need it continuous-drip transfusions, and, of course, all the other means we can carry around with us for the treatment of hæmorrhage and shock—usually a mixture of the two with one condition predominating.

The work of the laboratory is general, as can be seen from the list I have given, and it is only during time of attack that it is needed for transfusion work, and even then it can leave one man at the infirmary with sufficient material to carry on the more simple and essential work of that institution for the sick until the attack is over. Soon we hope to be investigating typhoid carriers, and already we have started examining suspected water-supplies. The scope of the laboratory will increase as its equipment reaches completion—i.e., a good reserve of reagents—and as the realisation of its potential use reaches the authorities concerned.

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PANEL AND CONTRACT PRACTICE

The Juveniles Come In

THE new Act came into force on April 4th and by that date a large number of young people, who had taken the precaution to secure membership of approved societies before they actually began to contribute, had received their medical cards. The medical cards were sent out by insurance committees on Saturday, April 2nd, and in some cases they reached the addressees in time to be taken to insurance doctors the same night, with the result that at least one insurance committee received a number of acceptances by first post on the Monday. With each medical card was enclosed a personal message from the Minister of Health which runs as follows:—

"The medical card which is sent to you by the Insurance Committee with this letter enables you to choose a doctor. You should make your choice now, so that you will know to whom you may go for medical treatment and advice when you require it.

"What I, as Minister of Health, want to impress on you is that the future of our country largely depends on the health and fitness of you young men and women. You can play your part by doing all you can to keep fit and well. If you have occasion to go to the doctor, you should remember to act upon any advice which he gives you for the future. This may make all the difference to your health and happiness in after life."

One word to those practitioners who apply for the school medical records of young persons. Remember that the name and address of the practitioner should be endorsed upon the inner smaller envelope before the application is dispatched to the insurance committee or the education authority. This may sound elementary, but applications are already being sent in without this and other essential information, and while it may be possible for the name and address of the applicant practitioner to be extracted from the form of application this is not possible with regard to the name of the school last attended. Should this information be omitted the child cannot be identified. Care in completing the application form will be repaid by the prompt receipt of the required school medical history.

Charging of Fees

An insurance committee has had a report on a number of cases in which insured persons have been charged fees by insurance practitioners. Most of the cases dealt with have arisen under Clause 7 (3) of the terms of service, no representation of insurance having been made by the patient to the doctor, and in such cases of course no question against the doctor can arise. In some of these the committee's attention had been invited by the doctor himself, as he had subsequently learnt that the patient was insured. There were, however, a number of cases in which representation of insurance was made and yet fees were charged. Sometimes the applicant being unable to produce evidence of insurance the doctor did not, as he should, issue an official receipt, where a fee was paid, or give notice on the official form to the patient of his intention to render an account. Such failure may arise through a misunderstanding of the doctor's obligations. In one case he did not, it seems, appreciate that the production of a stamped contribution card was sufficient evidence of insurance and title to medical benefit. In another he thought that a young person who had just entered insurance required to have six stamps on his card before being entitled to medical benefit. In a third the doctor was not aware that there was an official form for a notice of intention to submit an account, and in another he stated that he had no official forms as the occasion for their use so seldom arose. It would, however, have been a simple matter to give a private receipt endorsed to the effect that it was issued under Clause 7 (2) of the terms of service. In all these cases the doctor's attention was drawn by the insurance committee to his failure to observe the obligations laid upon him, no further action being taken. Repeated failure might entail a reference to the medical service subcommittee.

Dental Extraction under Anæsthetic

An insurance practitioner claimed that "dental extraction under anæsthetic" was beyond the scope of medical benefit. The local medical committee passed the claim and the insurance committee concurred. The claim was then sent to the Ministry of Health, who returned it in order that details might be given as to the service rendered and as to the special experience possessed by the practitioner in this kind of treatment. It should be remembered that not only must the service itself be of a specialist nature, but the practitioner must demonstrate that he holds the necessary special qualifications for its administration.

OBITUARY

Dr. EDWARD JOSEPH FOX, who died at his home at Warrington on March 31st at the age of 65, had been on the honorary staff of Warrington Infirmary since 1902. He was a student at Owens College, Manchester, and in 1893 took honours in physiology in the B.Sc. Lond. He qualified in 1897 and became F.R.C.S. Eng. in 1899. He was a clinical assistant at Moorfields and then in 1900 went into partnership with his father, Dr. E. A. Fox, at Warrington. He became an honorary surgeon at the infirmary in 1907 and in 1913 took charge of the newly formed ophthalmic department there. He was also radiologist to the infirmary until his death. He was a devout Roman Catholic and keenly interested in the cause of temperance. He leaves a widow, three sons, and one daughter.

Dr. ANNE MERCER WATSON, who has died in Edinburgh at the age of 76, was the daughter of Mr. D. M. Watson, of Dundee. She was educated at University College, Dundee, and after qualifying in 1899 (when she was 37) from the Edinburgh Medical College for Women practised for some years in Aberdeen in partnership with the late Dr. Laura Stewart-Sandeman. When the war came she joined the W.A.A.C.'s, for whom she was instrumental in recruiting many members. Of late years she had given much time to the service of the Edinburgh Women Citizens' Association, helping to work out plans for the development of civic life.

CHARING CROSS HOSPITAL STUDENTS' CLUB.—The annual ball of this club will be held on Tuesday, April 26th, at Grosvenor House, Park-lane, London, W.

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PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS

The Infanticide Bill through Committee

IN the House of Lords on April 7th Viscount DAWSON OF PENN said he interpreted the manifestation of opinion of their Lordships in giving a second reading to the Infanticide Bill as favouring the removal, wherever possible, of any stigma attaching to the unfortunate group of people affected by the Bill. In other words, if it were proved in court that a dependant was not responsible for her actions by reason of her state of mind at the time of the committal of the offence, their Lordships were in favour of removing any possibility of her being exposed to a charge of murder, to a verdict of guilty of murder, or, as an alternative, of guilty but insane. Everybody would wish that such a stigma about which public opinion had been stirred for sixty years should cease to exist. There was a strong body of opinion that the magistrates should have discretion, in obvious cases of this kind, when remanding defendants or committing them for trial to send them to homes or hospitals and not necessarily to prison. Up to now magistrates had thought that they had not that discretion, but he had found to his surprise since bringing in this Bill that though in practice they did not do so magistrates had the power to grant bail in cases of murder. It seemed, therefore, only necessary if there was any doubt for the Home Office to issue a circular to that effect.

Another matter about which he was deeply concerned was the verdict of guilty but insane. He had hoped that in this Bill they would be able to make it clear that once a court of assize had satisfied itself that a defendant was irresponsible by reason of the state of her mind it would be possible to return a verdict of "insane at the time, therefore not responsible, therefore not guilty." That was a form of verdict in vogue down to 1883, and fifteen years ago Lord Atkin's Committee, which contained some of the best criminal lawyers in the country, recommended unanimously that the old verdict should be reverted to in cases of irresponsibility. He had hoped to propose an amendment permitting that form of verdict in the case of this particular unfortunate group of people, but he was informed by his legal friends that there would be objections to that. Although they were in favour of altering the law in this respect, they said it would not be wise or desirable to alter it for this particular group only, and it must be applied to the broader group which Lord Atkin's Committee had in mind. As this subject concerned the border territory between medicine and law he was greatly impressed by what his legal colleagues had said and he felt he must bow to their opinion, although he did it with very great regret. He must try to persuade his legal colleagues to bring in a general Bill to provide that in any case where it was proved that a defendant was irresponsible at the time on account of insanity —however temporary that insanity might be—the verdict of "guilty but insane" should be replaced by a verdict of "insane, therefore not guilty."

The Archbishop of CANTERBURY shared the disappointment of Lord Dawson in finding that it was not possible to introduce an amendment to this Bill which would remove from the list of possible verdicts in cases of infanticide that of "guilty, but insane," and thought the House would agree that at an early date legislation should be brought in to give effect to the recommendations of Lord Atkin's Committee.—Lord ARNOLD would have preferred the Bill to be rather wider. He would like the time-limit to be longer and the causes which could justify a verdict of infanticide to be extended so as to cover mental disturbance due to distress and despair arising from solicitude for the child and extreme poverty, or either of these.—The Earl of MUNSTER, Lord-in-Waiting, said he would convey to the Home Secretary the views which had been expressed in the debate.—The House then went into Committee on the Bill and Lord DAWSON secured an amendment that a child should be deemed to have been recently born if it had been born within twelve months of its death. He also succeeded in altering the title of the Bill to "An Act to repeal and re-enact with modifications the provisions of the Infanticide Act, 1922."

In the House of Commons on April 7th the Middlesex Hospital Bill (which has already passed through the House of Lords) was read the third time and passed.

In the House of Commons on April 11th the Royal Sheffield Infirmary and Hospital Bill was read a second time.

Dr. Edith Summerskill, the newly elected Labour member for West Fulham, took the oath and her seat in the House of Commons on April 11th.

QUESTION TIME

WEDNESDAY, APRIL 6TH

Non-industrial Workers and Hospital Contributions

Mr. ROBERT GIBSON asked the First Lord of the Admiralty how many non-industrial workers at the Royal Naval Torpedo Factory, Greenock, and in the Admiralty service generally, would, respectively, by virtue of the recent decision, now be able to avail themselves of the new facilities to have their contributions for hospital purposes collected, by arrangement, by way of deduction from their pay.—Mr. DUFF COOPER replied: All non-industrial workers in Admiralty service at home will be able to have their contribution for hospital purposes deducted from their pay as soon as the new plan comes into force. The number involved is approximately 10,000, which includes about 200 at the Royal Naval Torpedo Factory, Greenock.

Mr. GIBSON asked the Secretary to the Treasury whether the scheme for collecting contributions for hospital purposes recently decided on would extend to non-industrial workers on Government staffs at home as well as to industrial workers on the said staffs, as was the case in the Admiralty service at home; and, if so, what services would be affected and how many workers in each service.—Colonel COLVILLE replied: Yes, Sir. The scheme will be made available to all Government staffs at home, whether industrial or non-industrial. The non-industrial staffs number approximately 370,000 and I am sending to the hon. and learned Member a copy of Command Paper 5543 which shows their distribution.

English-speaking Medical Unit in China

Mr. MATHERS asked the Prime Minister whether he had received any report on the work of the English-speaking medical unit in China; whether they had adequate supplies of clothing and medicaments; and how far such supplies were provided by the Lord Mayor's Fund.—Mr. BUTLER, Under-Secretary for Foreign Affairs, replied: The English-speaking unit works under the direction of the Secretary-General of the League of Nations, to whom it reports and by whom its medical and other supplies are furnished. It has no connexion with the Lord Mayor's Fund.

THURSDAY, APRIL 7TH

Nursery Schools

Mr. ANDERSON asked the Parliamentary Secretary to the Board of Education how many applications had been received from local authorities in the last 12 months for authority to provide nursery schools; and how many such applications had been granted.—Mr. KENNETH LINDSAY replied: During the year ended March 31st, 1938, proposals were received from local education authorities for the provision of 16 new nursery schools. One of these schools has been recognised by the Board and 14 other proposals have been approved in principle. The remaining proposal was received by the Board as recently as March 24th and is now under consideration.

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Measles Serum in L.C.C. Hospitals

Mr. LEACH asked the Minister of Health whether he was aware that disappointing results had followed the recent use of measles serum in London County Council hospitals; and whether he would have a strict investigation made of the claims made for the various serums in use, in view of recent criticism of a medical officer of health in regard to the employment of measles serum.—Sir KINGSLEY WOOD replied: In the special reports published by the London County Council on the epidemics of 1931–32 and 1933–34 it was stated that both convalescent and adult measles serum have proved of great value. The report on the epidemic of 1935–36 has not yet been published, but I am informed that there is no diminution of confidence on the part of this authority in the value of the serum. In these circumstances there would not appear to be grounds for a special investigation.

Juveniles and National Health Insurance

Mr. WHITELEY asked the Minister of Health whether he was aware that school-leavers were being instructed by school teachers as to the type of approved society to join; and whether he would consult with the Board of Education with a view to informing school-leavers that this was the work of approved societies and not the teachers in the schools.—Sir KINGSLEY WOOD replied: The reply to the first part of the question is in the negative, but if the hon. Member will give me details of any cases of which he is aware I will gladly have inquiries made.

Silicosis Medical Board Certificates

Mr. JAMES GRIFFITHS asked the Home Secretary the number of applications for certificates of disablement made to the Silicosis Medical Board and the number of certificates granted, the number of applications made for certificates that death was caused by silicosis and the number of certificates granted, from among coal-miners in Great Britain, with separate particulars for anthracite miners of South Wales, for each year from 1928 to 1937, respectively.—Mr. GEOFFREY LLOYD, Under-Secretary, Home Office, replied: The Medical Board did not deal with cases arising among coal-miners before June 1st, 1931. The following are the applications to the Medical Board for certificates under the Various Industries (Silicosis) Schemes since that date except that the number of applications for certificates from anthracite miners for the years 1931–35 are not available.

—	Coal-miners generally (including anthracite).				Anthracite only.			
	Applications for certificates.		Certificates granted.		Applications for certificates.		Certificates granted.	
	Disablement.	Death.	Disablement.	Death.	Disablement.	Death.	Disablement.	Death.
1931*	83	14	49	12	..	..	8	2
1932	174	46	122	39	..	..	57	12
1933	282	43	199	31	..	..	109	19
1934	366	58	211	35	..	..	119	20
1935	492	69	228	51	..	..	98	20
1936	674	118	319	77	311	61	182	39
1937	643	99	286	72	230	45	132	35

* June 1st to Dec. 31st.

FRIDAY, APRIL 8TH

Contraceptives (Regulation) Bill

Mr. CROWDER asked the Prime Minister whether arrangements could be made to provide special facilities for the passage of the Contraceptives (Regulation) Bill.—Mr. CHAMBERLAIN replied: In view of the state of Parliamentary business, I can hold out no hope of special facilities being given for the discussion of this Bill.

MONDAY, APRIL 11TH

Opium Manufacture in India

Mr. DAY asked the Under-Secretary of State for India the amount of the various alkaloids of opium manufactured at the Government's factory at Ghazipur and/or other Government factories in India during the 12 months ended to the last convenient date, and the amount derived from the sale of the same.—Lord STANLEY replied: The following statement shows the amounts of the various alkaloids of opium manufactured at the Ghazipur Opium Factory for the year ending Sept. 30th, 1937. The profit made on their sale was Rs. 47,426 annas 13:—

Morphine.				Codeine.
Hydrochloride.	Sulphate.	Tartrate.	Crude.	
lb. oz.	lb. oz.	lb. oz.	lb. oz.	lb. oz.
153 7	11 8	1 8	787 8	210 5

Feeding of Child Refugees in Spain

Mr. HARVEY asked the Prime Minister whether he could now make a statement as to the assistance which the Government proposed to give to the feeding of child refugees in Spain.—Mr. BUTLER replied: In order that the International Commission for the Assistance of Child Refugees in Spain may begin their relief work with as little delay as possible, His Majesty's Government have decided to offer to contribute £10,000 now to that organisation, provided that an equivalent amount is available from elsewhere. I trust that in these circumstances many other Governments will agree in like manner to modify the conditions attaching to their offers.

Tuberculosis in Wales

Mr. JAMES GRIFFITHS asked the Minister of Health whether the investigations recently conducted by the hon. Member for Montgomery (Mr. C. Davies) into the problem of tuberculosis in Wales was now completed; and whether it was intended to publish a report setting out the findings and outlining the recommendations as to the further steps to be taken to combat this disease in Wales.—Mr. BERNAYS replied: No, Sir. My right hon. friend is informed that the committee, of which the hon. Member for Montgomery is the chairman, have not yet completed their inquiries, and that they propose to hold a further sitting towards the end of this month. As regards the second part of the question my right hon. friend will consider the question of the publication of the report as soon as he receives it.

Silicosis among Coal-miners

Mr. JAMES GRIFFITHS asked the Secretary for Mines if the investigation conducted by His Majesty's inspectors into the environmental conditions at the Ammanford colliery, and their relation to the incidence of silicosis at that colliery, was now completed; and whether it was intended to publish a report on the investigation or take some other steps in the matter.—Earl WINTERTON replied as representing the Lord President of the Council: The inquiry into environmental conditions at the Ammanford colliery, in which H.M. Inspectors of Mines have assisted, is part of the investigation into chronic pulmonary disease among coal-miners which is being made under the direction of the Medical Research Council. The observations at Ammanford were recently concluded, and the records are now being carefully studied. It is proposed thereafter to extend the investigation to at least one further colliery, and the whole of the data will have to be examined before any report can be prepared.

Psychological Treatment of Prisoners

Sir RALPH GLYN asked the Home Secretary who appointed the special committee of investigation appointed to inquire into the psychological treatment of prisoners; when were they appointed; and how soon was it expected that they would make their report.—Sir SAMUEL HOARE replied: No special committee has been appointed. The investigation has been carried out by Dr. W. H. de B. Hubert, assistant physician to the department of psycho.

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logical medicine at St. Thomas's Hospital, in coöperation with Dr. East, the medical commissioner of H.M. Prisons. It is hoped to issue the report in the course of the next few months.

Public Telephones and Tuberculous Infection

Mr. ROBERT GIBSON asked the Postmaster-General if experiments had been made by officials of his department for the purpose of discovering whether or not tubercle germs were present in the mouthpieces of telephones in public kiosks which were, and were not, cleaned every morning, respectively, by an attendant; and, if so, with what results.—Major TRYON replied: Investigations of the kind in question have been repeatedly undertaken in this country and in the United States by independent bacteriologists at the instance of public health and other authorities. They are unanimous in concluding that the risk of tuberculous infection from the use of the telephone is negligible. This conclusion was verified by the Post Office medical department by means of separate research.

MEDICAL NEWS

University of London

The following have been recognised as teachers of the university in respect of posts held in the schools indicated:—

Dr. Matthew Young, anatomy, University College; Dr. Evan Jones, medicine, St. Thomas's Hospital medical school; Mr. E. S. Lee, surgery, Westminster Hospital medical school; Dr. F. P. L. Lander, medicine, Royal Free Hospital; Mr. M. W. P. Hudson, anæsthetics, Dr. Andrew Morland, medicine, Dr. E. Blake Pritchard, medicine, Mr. S. C. Suggit, oto-rhino-laryngology, and Mr. J. A. S. Wright, dental surgery, University College Hospital medical school.

On May 23rd, 24th and 25th, at 5.30 P.M., Dr. J. W. Trevan will lecture at the Wellcome Institute for Medical Research, Euston-road, N.W. He will speak on variation in the response of animals to drugs. On May 4th, at 5.30 P.M., Prof. Pol Gérard, professor of histology in the Université libre de Bruxelles, will lecture at King's College on comparative histophysiology of the vertebrate nephron. Prof. B. P. Babkin, research professor of physiology in McGill University, Montreal, will give two lectures on the physiology of the digestive glands at University College during June on dates which will be announced later. These are all special university lectures. On May 3rd, at 5.30 P.M., a public lecture will be given at University College by Dr. E. Braun-Menendez of the institute of physiology in the faculty of medical sciences at Buenos Aires. He will speak on some aspects of the heart sounds in normal and pathological conditions.

Royal College of Surgeons of England

A quarterly meeting of the council of the College was held on April 7th, with Sir Cuthbert Wallace, the president, in the chair. Prof. F. Wood Jones, F.R.S., was admitted to the fellowship, and Mr. Humphrey Nockolds and Mr. Mahmud Bayumi were elected fellows under the charter which permits the council to elect annually to the fellowship, without examination, two members of the college of twenty years' standing.

The subject for the Jacksonian prize for 1939 will be the pathology and treatment of thyrotoxicosis. Mr. H. A. T. Fairbank was appointed the first Robert Jones lecturer.

An additional final examination for the fellowship will be held in February, 1939. The posts of resident surgical officer and house surgeon in charge of general wards at the Stockport Infirmary were recognised for the six months' surgical training required of candidates for the final examination for the fellowship. Diplomas of fellowship were granted to John Guthrie Clothier (London), Alan Wardale (London), and Anthony Richard Kevin Kelly (Melbourne). Diplomas in child health were granted, jointly with the Royal College of Physicians, to the following candidates:—

Y. N. Ajinkya, James Carson, Cicily M. Glennie, Christopher Hardwick, K. J. Jacob, S. N. Javett, Lorna D. Jones, Shireen N. Khan, Beryl J. Lawrence, Robert Mowbray, A. P. M. Page, B. O. Quin, T. A. Ratcliffe, C. W. Ross, N. C. H. Rustomjee, Moses Schlaff, Emily L. Simon, W. M. Smithers, Naseem Subhie, Monty Toohey, Kathleen M. Winning, Eluned Woodford-Williams, and Winifred F. Young.

R.A.M.C. Reunion Dinner

The organiser of the reunion and dinner of the No. 4 Field Ambulance Guards, Old Comrades' Association, Mr. J. McKeown, would like to get in touch with officers who served with this unit during 1914-19. He would also like to hear from any medical officer who served with Nos. 3 and 9 Field Ambulances, or any unit in the Guards Division. He may be addressed at 90, Ashurst-road, London, N.12.

Royal College of Physicians of London

At a meeting of the college held on April 11th Dr. Robert Hutchison was elected president.

Diplomas in medical radiology were jointly conferred with the Royal College of Surgeons on D. M. Harper, Thomas Lodge, and J. T. McGinn, and a diploma in public health was conferred on R. R. Clipstein. Diplomas in ophthalmic medicine and surgery were granted to the candidates mentioned in our issue of March 19th (p. 702).

Grocers' Company Scholarship

Particulars will be found in our advertisement columns of the scholarship which this company offers every year "for the encouragement of original medical research into the causation of prevalent disease or as to means of preventing premature death."

The scholarship is tenable for two years (£300 for the first year and £450 for the second). Candidates should not be more than 35 years of age, and applications should be sent to the clerk of the company, Grocers' Hall, London, E.C.2, before May 1st.

Joint Tuberculosis Council

A series of intensive post-graduate courses are being held under the auspices of this council by Dr. Peter Edwards at Cheshire Joint Sanatorium, near Market Drayton. There will be demonstrations of artificial pneumothorax and allied procedures and methods of sanatorium administration will also be discussed. The next course will be held from May 2nd to 4th, and there will also be courses from June 27th to 29th, and from Sept. 26th to 28th. Further information may be had from Dr. William Brand, hon. secretary for post-graduate courses to the council, 8, Christ Church-place, Epsom, Surrey.

Institute of Child Psychology

At the annual public meeting of this institute held on March 31st Lord Northbourne, the president, spoke of the value of a scientific approach, without pre-accepted dogma, to human problems. There were great potentialities in human society that were either unrealised or misdirected, and investigation of the upbringing of children deserved support. Dr. Hazel Chodak Gregory said that it was extremely difficult to know the mind of a child and she commended the methods used at the institute. In some cases the treatment took a long time, but so did the treatment of a rheumatic heart or a tuberculous spine. Dr. Margaret Lowenfeld said that the basis of the institute's work, which had now been going on for ten years, could be summed up in the saying, "a child is a child." He or she should be studied directly and not only backward through the adult. The play therapy used at the institute was open and could be seen at any time by those interested; there was no secret analysis, but the child in the course of play gradually revealed his fears and inhibitions, his aggressiveness, his sense of deprivation, and other manifestations of the hidden motives which actuated his conduct. A new kind of worker was coming into existence, the psychologically-trained play therapist, who could be of help to doctors in the treatment of the neuroses and the behaviour and educational problems of childhood. Dr. Ethel Dukes spoke about the family as a social unit and the influence the institute exerted through its social workers. She appealed for new members who would take an interest in what was being done. The address is 6, Pembridge-villas, London, W.11.

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Auxiliary Royal Army Medical Corps Funds

The annual meeting of the members of the funds will be held at 5.15 P.M. on Friday, April 29th, at 11, Chandos-street, London, W.

Hospital for Sick Children, Great Ormond-street

Six vacancies on the medical staff of this hospital are noted in our advertisement columns. The appointments are to be made preparatory to the occupation of the new hospital.

The Problem of Blindness

On opening new municipal workshops for the blind at Stratford, London, on Monday last, Sir Kingsley Wood, the Minister of Health, said there were some 78,000 registered blind persons in England, Wales, and Scotland and of these nearly 57,000 were aged fifty or over. He did not think the number of blind people in this country was increasing, and owing to our increased knowledge of the causes of blindness the age at which persons are first registered as blind was becoming steadily and progressively later. There had also been a substantial fall in the number of blind children; the number between the ages of five and sixteen had fallen since 1925 by nearly 38 per cent. Despite the fortitude and cheerfulness with which blindness was borne it was a great and terrible handicap, more particularly to the great majority of blind persons over forty years of age, because it was not then normally practicable to train them in a new form of employment. The lowering of the pension age to forty which had recently been approved by Parliament would at any rate secure to many of the blind population a regular source of income. Domiciliary assistance to blind people was no longer to be given under the poor-law but under the Blind Persons Act.

Vacancies

For further information refer to the advertisement columns

Accrington, Victoria Hosp.—H.S., £175.
Altrincham General Hosp.—Sen. and Jun. H.S.'s, £150 and £120 respectively.
Bedford County Hosp.—Second H.S. and Cas. O., at rate of £150.
Birmingham, Canwell Hall Babies' Hosp.—Res. M.O., at rate of £250.
Birmingham City, Maternity and Child Welfare Dept.—M.O., £600.
Birmingham, Royal Cripples' Hosp.—Res. H.S., at rate of £200.
Blackburn, Queen's Park Hosp. and Institution.—Res. Jun. Asst. M.O., £200.
Blackburn Royal Infirmary.—Res. H.P., £175.
Board of Control, Northumberland-avenue, W.C.—Commissioner, £850.
Bolton Education Committee.—Asst. M.O.H. and Asst. School M.O., £500.
Bradford City.—Asst. City Pathologist, £500.
Bristol City and County.—Asst. M.O.H., £500.
British Postgraduate Medical School.—First Asst. in Dept. of Medicine, £300–£350. Part-time Demonstrator in Clin. Med., £100. Also Asst. Consulting Dental Surg., £750.
Capetown City.—Tuberculosis Officer, £800.
Cardiff, King Edward VII Welsh National Memorial Assoc.—Asst. Res. M.O. for North Wales Sanatorium, £200.
Cardiff Royal Infirmary.—Res. Anæsthetist, at rate of £100.
Chester Royal Infirmary.—H.P., £150.
Dartford, Bergman Osterberg College.—Lecturer in Physiology and Hygiene.
Derbyshire Royal Infirmary.—H.P., and H.S. for Ear, Throat, and Nose Dept., each £150.
Dreadnought Hosp., Greenwich, S.E.—H.P., at rate of £110.
Dudley, Guest Hosp.—Res. Surg. O., at rate of £250–£300. Also H.S., at rate of £100–£130.
Exeter, Princess Elizabeth Orthopædic Hosp.—Res. H.S., at rate of £150.
Gravesend Borough.—Asst. M.O.H. and School M.O., £600.
Great Yarmouth General Hosp.—H.S., £140.
Grocers Company, Grocers' Hall, E.C.—Scholarship, £300.
Hastings, Royal East Sussex Hosp.—Jun. H.S., at rate of £150.
Hendon Borough.—Asst. M.O.H. and Asst. School M.O., £600.
Holborn Metropolitan Borough.—Asst. M.O., £600.
Hosp. for Consumption and Diseases of the Chest, Brompton, S.W.—Asst. Physician.
Hosp. for Sick Children, Great Ormond-street, W.C.—Res. Asst. Physician, £200. Out-patient M.O., £150. Two Res. Med. Assts. and Clin. Pathologists, each £125. Asst. Res. Surg. O., £100. Also H.S., at rate of £50.
Hostel of St. Luke, 14, Fitzroy-square, W.—Res. M.O., at rate of £200.
Huddersfield Royal Infirmary.—H.S. to Abnormal Maternity Dept., H.S. to Ear, Nose, and Throat Depts., and H.S., each at rate of £150.
Hull Corporation, Health Department.—Asst. M.O.H., £600.
Ilford, King George Hosp.—Asst. Cas. O. and H.S. to Spec. Depts., at rate of £100.
Isleworth, West Middlesex County Hosp.—Res. Cas. M.O., £350.
King Edward Memorial Hosp., Ealing, W.—Cons. Physician and Second Cons. Laryngologist.
Liverpool and District Hosp. for Diseases of the Heart.—H.P., at rate of £100.
London Chest Hosp., Victoria Park, E.—Surg. and Med. Regs., £225 and £175 respectively.
London Corporation.—M.O.H. for Port of London, £1500.
Manchester Royal Infirmary.—Bacteriologist for post of Director of Clin. Laboratory, £800.
Middlesex Hosp., W.—Obstet. and Gynæcological Reg., £300.
Newcastle, University of Durham and Royal Victoria Infirmary.—Professorship of Pathology and Pathologist, £1100.
Newcastle-upon-Tyne Royal Victoria Infirmary.—Reg. to Orthopædic Dept., £150.
Norwich, Norfolk and Norwich Hosp.—Cas. O., £120.
Preston and County of Lancaster Royal Infirmary.—H.S. to Eye, Ear, Nose, and Throat Dept., at rate of £150.
Queen Mary's Hosp. for the East End, Stratford, E.—Hon. Asst. Surgeon.
Rochdale Infirmary and Dispensary.—Second H.S., £150.
Romford, Oldchurch County Hosp.—Obstetric Surgeon, £600.
Rotherham Hosp.—H.P., £180.
Royal Chest Hosp., City-road, E.C.—H.P., at rate of £100.
Royal Naval Dental Service.—Dental Officers.
Royal Naval Medical Service.—Medical Officers.
Royal Northern Hosp., Holloway, N.—Clin. Asst. to Ear, Nose, and Throat Dept.
Royal Waterloo Hosp. for Children and Women, Waterloo-road, S.E.—Res. Cas. and Orthopædic H.S. and H.P., at rate of £150 and £100 respectively. Also Hon. Surg. Reg.
Salisbury General Infirmary.—H.P., at rate of £125.
Samaritan Free Hosp. for Women, Marylebone-road, N.W.—H.S., at rate of £100.
Southampton County Borough.—Asst. M.O.H., £500.
Stirling District Mental Hosp., Larbert.—Jun. Asst. M.O., £300.
Stoke-on-Trent, Burslem, Haywood, and Tunstall War Memorial Hosp.—Res. H.S., at rate of £175.
Stoke-on-Trent, North Staffordshire Royal Infirmary.—Res. Anæsthetist, £150.
University of London.—Chair of Anatomy, at London Hosp. Med. College, £1000.
Weir Hosp., Grove-road, Balham, S.W.—Jun. Res. M.O., £150.
Wembley Borough.—Asst. M.O.H., £500. Also Part-time Asst. M.O., 1½ guineas per session.
West London Hosp., Hammersmith, W.—Additional Hon. Reg. to Throat, Nose, and Ear Dept.
Westminster Hosp. Convalescent Home, Parkwood, Swanley, Kent.—Res. M.O., at rate of £200.
Willesden General Hosp., Harlesden-road, N.W.—Hon. Clin. Asst. to Med. Out-patient Dept.
Winchester, Royal Hampshire County Hosp.—H.S., at rate of £100.
Wolverhampton, New Cross Hosp.—Res. Asst. M.O., £200.
York County Hosp.—Hon. Ophth. Surgeon.

Medical Diary

April 18th to April 24th

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

THURSDAY.

Physical Medicine. 4.30 P.M., Prof. Piery (Lyons): Modern Medical and Biological Climatology (Samuel Hyde lecture). Sir Henry Gauvain will also speak.

NORTH LONDON MEDICAL AND CHIRURGICAL SOCIETY.

WEDNESDAY.—9.15 P.M. (Royal Northern Hospital, Holloway-road, N.), clinical evening.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane-road, W.

TUESDAY.—2.30 P.M., Sir Edmund Spriggs: Diseases of Small and Large Intestine.

WEDNESDAY.—Noon, clinical and pathological conference (medical). 3 P.M., clinical and pathological conference (surgical). 4.30 P.M., Dr. C. H. Andrewes: Recent Work on Viruses.

THURSDAY.—2.15 P.M., Dr. Duncan White: radiological demonstration. 3.30 P.M., Mr. Wilfred Shaw: Neoplasms of the Ovary.

FRIDAY.—2 P.M., clinical and pathological conference (obstetrics and gynæcology).

Daily, 10 A.M. to 4 P.M., medical clinics, surgical clinics and operations, obstetrical and gynæcological clinics and operations.

ST. JOHN CLINIC AND INSTITUTE OF PHYSICAL MEDICINE, Ranelagh-road, S.W.

FRIDAY.—4.30 P.M., Dr. Philip Ellman: Body Build in Relation to Cardiovascular and Rheumatic Diseases.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

SATURDAY and SUNDAY.—Course in Cancer at the ROYAL CANCER HOSPITAL, Fulham-road, S.W.

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NOTES, COMMENTS, AND ABSTRACTS

THE TAVISTOCK CLINIC APPEALS

THE report of this clinic for 1937 discloses a critical state of affairs. Last year's report made an urgent appeal for funds, but the early and substantial response for which it asked was not given. Unless the situation is relieved the clinic will have to curtail its work and abandon all the steps which it has been taking towards expansion. The council feel that this would be a disaster not only to the clinic but also to the cause of national fitness and to medical and industrial progress; and they are so unwilling to believe that the public, and particularly those bodies and persons who are particularly interested in the work of the clinic, will permit this catastrophe that they have taken the risk of postponing irrevocable action for a short time. They have abandoned any wide public appeal for a new building programme, and have reorganised their machinery for securing support for the clinic's present activities and for its tenure of the building site already purchased. If the financial response is not better this year this site will have to be disposed of and the present work will have to be restricted in order to ensure keeping the clinic open. Only a number of special donations, and the offer of the medical staff and some of the social workers to forego their honoraria, have obviated the necessity for drastic reduction of the work in progress already. The council hope that this sacrifice by the staff may be accepted as a challenge by those who are able to support the clinic in other ways. The associated hostel was closed in June, not primarily through lack of funds but because the premises had become unsafe. Its loss naturally affected the work of the clinic, which finds a modest in-patient department essential. The status and reputation of the clinic were never highly, and it can justly claim credit for creating the interest in the out-patient treatment of neurotic disorders of which there is evidence throughout the country. The number of hours of treatment have dropped by 648 since 1936. From the point of view of pressure on space there is some advantage in this decrease, which has made no difference to the quality of the work done or to the suitability of the cases chosen for post-graduate instruction. One reason that he gives for the drop in number of visits is that both doctors and patients have been somewhat less adaptable as regards hours. The doctors have been busier in private practice and less able to adjust their times to suit patients; and, owing to lessened unemployment, more patients are in work and can therefore only attend at specified times. The increase in the minimum rate of payment by patients—the figure is now 3*s*. per interview—has caused some cancellations of appointments and cessation of treatment. The medical director, Dr. L. Rees, believes that it should be possible to solve much of the nation's problem of mental ill health if there were more doctors with special training in the treatment of the psychoneuroses. The educational work of the clinic is perhaps its most important contribution; but requests received from many places in the British Isles for the names of doctors who are adequately trained in this branch of medicine often have to be refused. If a foundation like the Tavistock Clinic is to be used to full advantage, the doctors trained in it must go out and settle all over the country. The clinic's list of past staff contains about sixty names of physicians and clinical assistants, not counting those who have died or gone abroad. Of these, the *Medical Directory* shows only eight now resident in the provinces. The problem of the attack of psychoneurosis is at the present stage almost entirely one of training personnel. The most effective approach to it may before long be found in the provision of special courses throughout the country at the medical teaching centres, working in coöperation with the treatment centres in their neighbourhood. The chairman of the Tavistock notes with satisfaction that other hospitals and clinics are now doing similar effective work and none can doubt the urgency of the need for it.

A DEMOGRAPHIC STUDY OF THE FRENCH COLONIES

THE February number of the Office International d'Hygiène publique has a supplement by Drs. Martial and Bandiment on the population, natality, and mortality statistics of the French Colonies and mandated territories, which comprise a total area of 9,023,813 square kilometres with a population of 1,088,000 European and "assimilated" and 48,805,000 natives. The monograph consists chiefly of statistical tables, with explanatory comments, summarising a large number of documents relating to the years 1930–35, and compiled for the purpose of indicating the sex and racial composition and increases of the populations of the different areas, and the variations in natality and mortality during those years. The authors admit that the statistics are incomplete and defective, but it is thought that they afford evidence of substantial progress, of increasing population and diminishing mortality. The figures indicate that in many areas there have been decreases in abortions, stillbirths, and child mortality, but the general level of mortality is still high. The main fact, however, that emerges from a study of the report is that though the authors have done what they could to make use of the statistical material at their disposal, the statistics are so defective that it is difficult to draw valid inferences from them. The census arrangements and the registration systems in operation are far from covering the whole population of the respective areas. A recorded increase in the population of an area may mean nothing more than an improvement in the enumeration procedure. The monograph, in fact, supports the opinion expressed by Dr. Kuczynski in his recent book, "Colonial Population," that "the population statistics of most colonies are today in a condition similar, in many respects, to that of the population statistics of most European countries 150 years ago." The operation of efficient census enumerations and birth and death registration systems in such countries as French West and Equatorial Africa would be enormously difficult even if reasonably adequate funds were provided for the purpose; but improvements are being made, and it may be hoped will be made on a larger scale, when the importance of population statistics is better appreciated by the governments concerned.

GEORGES DREYER [1]

Georges Dreyer, the late professor of pathology at Oxford, had great enthusiasm and an extraordinary gift for good-fellowship. The war gave ample scope for these qualities which are clearly brought out in a biography [1] written by his wife. Apart from the vivid account of the chief landmarks of his scientific career, the story told is one of simple domestic happiness, and though the English is sometimes obviously that of a foreigner the writing has considerable charm. Mrs. Dreyer has an individuality of her own and not the least interesting portion of the book is the record of her own reactions as a foreigner to English and Oxford life. Dreyer's friends, and he had many, will be glad to have this modest record of the home life of one whose position of eminence in British scientific medicine in the years after the war was a remarkable tribute to the genial personality of a foreigner.

[1] Georges Dreyer. A Memoir by his wife Margrete Dreyer. With an introduction by Sir Charles Sherrington, O.M. Oxford: Basil Blackwell. 1937. Pp. 249. 10*s*. 6*d*.

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PRIMARY STREPTOCOCCUS ENDOCARDITIS

MUCH less frequent than the subacute endocarditis described by Osler is the primary streptococcal form. R. B. A. Bergeron (Thèse de Paris, 1938, No. 10) records 19 cases in patients ranging in age from 6 to 56. He states that the disease may affect the mitral valve alone (in 30 per cent. of the recorded cases), the aortic valve alone (in 25 per cent.), both the mitral and aortic valves (in 10 per cent.), the mitral and tricuspid (in 5 per cent.), or the intraventricular septum. The lesions are those of an ulcero-vegetative endocarditis with relatively small, soft, and friable vegetations—in contrast with Osler's disease in which the vegetations are often indurated. Valvular perforations and aneurysms, found in about a quarter of the cases, were also much more frequent than in subacute endocarditis. In every case the streptococcus has been obtained in pure culture, usually from the blood and sometimes from the vegetations, or both. In most of the cases on record the nature of the streptococcus has not been stated. When it has been identified in a few of the cases it was more often of the viridans type than hæmolytic. The portal of entry of infection is usually difficult to discover. About a fifth of Bergeron's cases were of puerperal origin. Other sources of infection were appendicitis, cholecystitis, whitlow, or a wound of the hand. Tonsillitis and acute articular rheumatism, which are so frequent in Osler's disease, do not appear to have been noted. The onset of the endocarditis is sometimes sudden, unlike what is observed in the subacute form. Anæmia is moderate, and leucocytosis variable, white cell count sometimes being normal. At the height of the disease the principal symptoms are those of an infective condition, with pallor and asthenia. The temperature varies, but it is always remarkable for its irregularity. The spleen is almost always enlarged. A few patients with purpura or other hæmorrhagic manifestations have been observed. A meningeal reaction and renal involvement are both common. The physical signs also are those of ulcero-vegetative endocarditis. In the most typical cases the valvular murmur reaches its fullest intensity at once, while in others its development is slowly progressive and sometimes even late in appearance. Occasionally no murmur has been detected and the diagnosis has not been made until the necropsy. Embolism is frequent in the spleen, kidneys, and cerebral arteries. Cardiac failure is very rare, and death is usually due to aggravation of the general condition accompanied by cachexia, the renal symptoms sometimes predominating. The duration of the disease varies from fifteen days (in 15 per cent.) to three or even six months. The diagnosis must be made from typhoid fever, acute articular rheumatism, incipient septicæmia, meningitis, and Osler's disease. Salicylates even in very large doses do not produce any improvement, and the prognosis is invariably bad.

EVOLUTION OF FORENSIC CHEMISTRY

THE Institute of Chemistry has issued a reprint of the Tatlock lecture, delivered at Glasgow last October by Mr. C. Ainsworth Mitchell, D.Sc. The lecturer, who is well known as editor of the *Analyst* and as an authority on documents and on the chemical aspects of fur dermatitis, traced the growth of scientific toxicology from the end of the sixteenth century to the present time. The first systematic treatise seems to have been written by Valentini in 1722, but Teichmeyer's "Institutiones Medicinæ Legalis," published a year later, was for many years regarded as the standard text-book. In this work the symptoms and post-mortem appearances are described for many poisons but no tests for their recognition are given. The "Toxicologie Générale" of Orfila, whose portrait forms a frontispiece to the tamphlet, was published in 1814, and laid the foundapions of modern toxicology. This work, although full of information about experiments on animals and about cases of human poisoning, hardly touches chemical identification.

The "Medical Jurisprudence" of Paris and Fonblanque was the first trustworthy text-book in England on toxicology, but the chemical detection of poisons did not receive adequate attention until Christison of Edinburgh published his "Treatise on Poisons" in 1829. Swaine Taylor of Guy's published the first edition of his "Principles and Practice of Medical Jurisprudence" in 1844 and his "Handbook of Poisons" in 1848. Sir Thomas Stevenson, whom many will remember as a kindly and modest man of vast knowledge, edited the third edition of Taylor's "Medical Jurisprudence," and by his careful work and trustworthy evidence in many murder trials did much to establish the foundations of chemical toxicology. His successors, Sir William Willcox, John Webster, and Roche Lynch, have carried on the tradition of sound and minute investigation.

An early German toxicologist, Plenck, laid down the dictum that the only conclusive proof of poisoning was the detection of the poison in the body, but Christison, Guy, and other British toxicologists held that, although chemical evidence was of the very first importance, yet in some cases the medical probability, in conjunction with other evidence, might be so strong as to leave no doubt of poisoning. Even in the time of Orfila, however, it was regarded as unsatisfactory that in the face of ample evidence of administration of arsenic the poison could not be detected in the stomach. This led him to devise methods for extraction of arsenic from the viscera. Taylor, commenting on the trial of Thomas, in 1843, when arsenic was found in the liver but not in the stomach or intestines, wrote: "This case shows that the detection of absorbed arsenic must henceforth form part of the duty of the medical jurist."

MAYO CLINIC BIOGRAPHIES

BIOGRAPHIES in alphabetical order of men who have worked at the Mayo Clinic or Foundation for a year or more, including photographs and apparently complete bibliographies arranged chronologically, form the substance of a volume[1] recently issued. Following these biographies are short accounts of those who have been connected with the institutions for shorter periods. There are two indexes, the first arranged under universities and colleges, and the second geographically. The biographies are purely professional and, though very detailed, more personal notes would have added greatly to their interest. In many cases, for example in the accounts of the brothers Mayo themselves, there is little but a schedule of honours. Space is wasted by giving the initials of qualifications at the heads of the entries and repeating them in full lower down. This is particularly noticeable when the L.R.C.P. diploma appears for a second time among the memberships of learned societies. There are some minor inaccuracies —in one English entry consulting surgeon is printed where house surgeon is clearly intended—but the book will undoubtedly be valuable to those who may be called upon at short notice for biographies of American doctors or travelled British ones. We commend it especially to honorary secretaries of official dinners where distinguished foreign guests are to be honoured.

NON-TUBERCULOUS ERYTHEMA NODOSUM

THE belief that erythema nodosum is by no means pathognomonic of tuberculosis finds support in an account given by Dr. H. Ernberg and Dr. O. Gabinus of an outbreak of this disorder in Stockholm in the spring of 1937 (*Nord. med. Tidskr.* Feb. 19th, 1938, p. 300) in which the patients proved to be tuberculin-negative. The authors, who are attached to a children's hospital in Stockholm, consulted the

[1] Physicians of the Mayo Clinic and the Mayo Foundation. London: Humphrey Milford, Oxford University Press. 1937. Pp. 1575. 45*s*.

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medical superintendents of the three other large children's hospitals in the city and ascertained that they had all had a similar experience. In the four children's hospitals in the period 1928–36 inclusive there were 420 cases of erythema nodosum, in 386 of which the patients were tuberculin-positive, while in the remaining 34 they were tuberculin-negative. In the first half of 1937 as many as 20 of the 34 cases of erythema nodosum tested with tuberculin were found to be tuberculin-negative. It was remarkable that all the tuberculin-negative cases were limited to April and May of this year, whereas the tuberculin-positive cases were fairly evenly distributed over the first half of 1937. Further, there was a concentration of the tuberculin-negative cases in certain parts of the town. The youngest child was seventeen months old, and the oldest twelve years, most of the 20 children being between three and five. The tuberculin-testing was so thorough that, when the Pirquet reaction failed, increasing doses of tuberculin were administered by intracutaneous injection. The radiological findings in these tuberculin-negative cases were not characteristic of those tuberculous changes often observed in cases of erythema nodosum with a positive tuberculin reaction. One of the tuberculin-negative cases was complicated by pneumonia and empyema which ended fatally. The post-mortem examination failed to reveal any tuberculosis.

EMPLOYMENT FOR THE DEAF

APART from financial considerations, enforced idleness in those who become unemployed as the result of deafness may have serious effects in encouraging the habit of introspection to which deaf people are specially liable. Unfortunately ordinary employment exchanges are of little use in finding work for the deaf, as their officials cannot advance those eleemosynary appeals necessary to induce employers to give deaf workers a trial, and at present there are no voluntary organisations for this purpose. In a letter to the *Times* of April 11th Lord Montrose said that the National Institute for the Deaf is opening an industrial department at its headquarters for the study of this problem, and it is hoped that this department will soon be in a position to seek work for those who come to it for assistance. The new department will operate in London only and will not concern itself with the deaf and dumb who are already provided for. A list of employers who are willing to consider applications from deaf workers is the first requirement and the Institute hopes that such employers will notify it of their willingness. Lord Montrose points out that there is no charity in employing deaf people as their very deafness helps them to concentrate on their work and they are not distracted by talk and noise; they do, however, need a little sympathy and consideration from their employers and fellow workers.

Corrigendum.—In the review in our issue of April 2nd (p. 786) the title of Kolmer and Boerner's book should read "Approved Laboratory Technic."

Appointments

BEHRMAN, SIMON, M.R.C.P. Lond., Diagnostic Physician to the Tavistock Clinic, London.

CAMPBELL, J. P., M.B. St.And., F.R.C.S. Edin., Surgical Registrar at Harlow Wood Orthopædic Hospital, near Mansfield.

EASTWOOD, C. G., M.B. Manch., D.P.H., Deputy Medical Officer of Health for Dagenham.

HOUSTON, B. D., M.B. Durh., Assistant to the Radiological Department of the Royal Victoria Infirmary, Newcastle-upon-Tyne.

JOHNSON, J. A. R., M.B. Birm., Resident Surgical Registrar at the Queen's Hospital, Birmingham.

KEELE, K. D., M.D., M.R.C.P. Lond., Fourth Physician to the Evelina Hospital for Sick Children, London.

SHORT, CRISSIE, M.B. Edin., L.M., D.P.H., Assistant Medical Officer of Health for Surrey.

STEVEN, MURIEL H., M.B. Lond., D.P.H., Assistant Medical Officer of Health for Surrey.

London County Council Hospital Staff.—The following appointments and promotions and transfers are announced. A.M.O. (I) or (II) = Assistant Medical Officer, Grade I or II:—

SMITH, HARRY, M.R.C.S. Eng., D.P.H., A.M.O., Central Administrative Staff;
MCNEISH, W. J., M.B. Glasg., D.P.H., A.M.O., Central Administrative Staff;
DAWKINS, A. L., M.B. Adelaide, M.Ch.Orth, Liverp., F.R.C.S. Edin., F.R.A.C.S., A.M.O. (I), St. Mary Abbots;
WESTON, F. H., M.B. Lond., A.M.O. (I), St. George-in-the-East;
DICKIE, ALICE E., M.D. Glasg., A.M.O. (I), Lambeth;
DOWSETT, LYNETTE, M.D. Lond., A.M.O. (I), Grove Park;
MACLEOD, J. D., M.B. Lond., A.M.O. (I), Lambeth;
THORNTON, H. L., M.R.C.S. Eng., A.M.O. (II), St. Andrew's;
TATE, MARY G., M.B. Lond., A.M.O. (II), Mile End;
FAIRWEATHER, R. F., M.B. St. And., A.M.O. (II), Hammersmith;
DAVIES, R. D. L., M.B. Lond., A.M.O. (II), New End;
BROWNE, OLIVE M., M.B. Edin., A.M.O. (II), Paddington;
MAXWELL, R. J. C., M.Ch. Belf., F.R.C.S. Eng., A.M.O. (II), King George V. Sanatorium;
HOGARTH, MARGARET C., M.B. Aberd., Principal A.M.O., Central Administrative Staff;
HENDERSON, R. G., M.D. Aberd., D.P.H., Principal A.M.O., Central Administrative Staff;
THORNTON, C. E., M.B. Lond., Divisional Medical Officer, Central Administrative Staff;
POLHILL, M. C., M.B. Lond., Divisional Medical Officer, Central Administrative Staff;
REID, J. O., M.D. Edin., Medical Superintendent, Princess Mary's Convalescent Home, Margate;
SWYER, ROBERT, M.R.C.S. Eng., D.P.H., Deputy Medical Superintendent (I), North-Eastern;
BUTTERWORTH, JOAN, M.B. Lond., Senior A.M.O. (II), Northern;
CLARK, D. C., M.B. Lond., A.M.O. (I), St. Mary, Islington;
GLENNIE, CICILY M., M.B. Aberd., A.M.O. (II), Queen Mary's Carshalton;
FABER, G. R., M.A. Camb., M.R.C.S. Eng., A.M.O. (II), Paddington;
LAIRD, G. B. L., M.B. Glasg., A.M.O. (II), St. Giles;
LILLIS, W. J. P., L.R.C.P. Irel., L.M., Senior A.M.O. (II), North-Eastern; and
SUTHERLAND, H. A., M.B. Glasg., A.M.O. (II), St. Andrew's.

Hospital for Sick Children, Great Ormond-street.—The following appointments are announced:—

COPE, J. W., B.Chir. Camb., F.R.C.S. Eng., Out-patient Aural Registrar;
INNES, C. B., M.B., N.Z., House Surgeon;
BONHAM-CARTER, R. E., M.B. Camb., M.R.C.P. Lond., House Physician; and
COURT, D. M., M.B. Birm., M.R.C.P. Lond., House Physician.

Colonial Medical Service.—The following appointments and promotions are announced:—

HEMSLEY, A. G., M.R.C.S., Medical Officer, Fiji;
MINNETT, J. S., M.B. Camb., Medical Officer, West Africa;
CAMPBELL, J. M., M.B. Edin., D.P.H., D.T.M., Deputy Director of Medical Services, Northern Rhodesia;
RAE, A. M. W., M.D. Edin., Deputy Director of Medical Services, Gold Coast;
THOMAS, L. H., B.A. Oxon., M.R.C.S. Eng., Medical Officer of Health, Gambia; and
WALKER, G. B., M.B. Edin., D.P.H., Deputy Director of Health Service, Nigeria.

Medical Referees under the Workmen's Compensation Act, 1925, for the Sheffield and Rotherham County Court Districts (Circuit No. 13): A. W. FAWCETT, M.B., Ch.B., F.R.C.S., and W. S. MCINTYRE, M.B., Ch.B., both of Sheffield.

Births, Marriages, and Deaths

BIRTHS

RECKITT.—On April 10th, at Streatham, the wife of Dr. V. B. Reckitt—a daughter.

STOKES.—On March 14th, at Melbourne, the wife of Dr. Lawrence Stokes—a daughter.

THOMSON.—On April 9th, at Putney, S.W., the wife of Dr. W. A. R. Thomson—a son.

MARRIAGES

BROWN—HARDY.—On April 9th, at Epperstone Church, Notts, David G. W. Brown, F.R.C.S., of Sunderland, to Alyson, second daughter of Dr. Percy Hardy, of Nottingham.

HARDY—HURST.—On April 5th, at Parish Church, Whitstable, Kenneth William Hardy, M.B., of Sittingbourne, to Sheila Kathleen Hurst, of Letchworth.

PITT-PAYNE—JONES.—On April 9th, at the Parish Church, Bromley, Kent, W. S. Pitt-Payne, M.R.C.S., second son of Dr. W. Pitt-Payne, of Bromley, to Evelyn, only daughter of Mr. C. H. Jones, of Beckenham.

DEATHS

BROOKE.—On April 7th, at Worthing, Tom Balleny Brooke, L.R.C.P. Edin., late of Forest Hill.

LINDSAY.—On April 9th, William Joseph Lindsay, M.B.E., M.D. Camb., of Wimpole-street and Herne Hill.

SYMONS.—On April 1st, at Indore, C. India, Henry John Hugh Symons, M.C., Lieut.-Colonel, I.M.S., elder son of Dr. John Symons, Penzance.

WATSON.—On April 4th, at Edinburgh, Anne Mercer Watson, L.R.C.P. Edin., aged 76.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

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ADDRESSES AND ORIGINAL ARTICLES

SOME DEFICIENCIES OF NUTRITION AND THEIR RELATION TO DISEASE *

By CHARLES C. UNGLEY, M.D. Durh., F.R.C.P. Lond.

ASSISTANT PHYSICIAN, ROYAL VICTORIA INFIRMARY, NEWCASTLE-UPON-TYNE; LEVERHULME RESEARCH SCHOLAR, ROYAL COLLEGE OF PHYSICIANS OF LONDON

II—NUTRITIONAL DEFICIENCY IN RELATION TO ANÆMIA

THE recent great advances in our knowledge of this subject originated in the animal experiments of Whipple, the discovery of liver therapy by Minot and Murphy, and the clinical experiments of Castle. The anæmias of nutritional deficiency include a macrocytic group responding to substances effective in pernicious anæmia and a hypochromic group responding to iron. The macrocytic anæmias are characterised by a defect in cell production, while in the hypochromic anæmias hæmoglobin production is particularly at fault. Anæmia can also arise from a deficiency of vitamin C or of thyroxine.

Macrocytic Anæmias due to Deficiency of Substances Effective in Pernicious Anæmia

The normal individual obtains essential nutriment for blood regeneration from the interaction of an intrinsic factor in gastric juice and an extrinsic factor in food. The material which results from this interaction is absorbed from the intestine and stored in the liver and other organs. Addisonian pernicious anæmia arises chiefly from a deficiency of the gastric factor, but the syndrome of nutritional macrocytic anæmia may arise in other ways. Thus dietary deficiency is the prime cause of tropical macrocytic anæmias. Deficient absorption of preformed hæmopoietic material from the intestine or its destruction therein may contribute to the production of the macrocytic anæmia found in some cases of sprue, intestinal stricture, and multiple intestinal anastomoses. In pregnancy a latent partial deficiency may become manifest owing to the demand of the fœtus for hæmopoietic material. Disorder of the intermediate or internal metabolism of "liver extract" may perhaps occur and has been thought to account for the macrocytic anæmia of liver cirrhosis. Infection and arterio-sclerosis are sometimes contributing factors in the ætiology of nutritional anæmias.

Pernicious Anæmia

Attention has already been drawn to Samuel Fenwick's (1880) emphasis on the relationship of atrophy of the stomach to pernicious anæmia. Hurst and Bell (1922) stressed the essential unity of pernicious anæmia and subacute combined degeneration, and the almost uniform presence of achlorhydria. The defect in gastric secretion is of severe degree, but the essential feature is a deficiency of Castle's intrinsic factor. The work of Meulengracht (1935) suggests that in the pig this gastric factor is formed in the pyloric gland region and also in Brunner's glands in the duodenum, which are morphologically similar. Our own experiments confirm Meulengracht's dictum that pepsin and the anti-anæmic factor are dissociated physiologically and anatomically in the stomach. *Fundus* mucosa extracts contained pepsinogen but were hæmopoietically inactive when administered with a source of extrinsic factor. In extracts of *pylorus* mucosa on the other hand, pepsin and pepsinogen were absent or very slight in amount, but they were a good source of Castle's intrinsic factor (Ungley and Moffett 1936).

Magnus and Ungley (1938) have reported a histological study of the stomachs of 7 patients with pernicious anæmia who died during a relapse. In all cases a characteristic lesion was found, localised in its distribution to the region of the body (fundus) mucosa. The pyloric antrum and duodenum, where it has been assumed the intrinsic factor is produced, showed no pathological abnormality. There is, therefore, a morbid anatomical basis for the achylia gastrica found in pernicious anæmia but not for the absence of intrinsic factor if we assume that it is produced in the regions already stated. The lesion is an atrophic process affecting all coats of the stomach wall and from its histological appearances is almost certainly not the end-result of an inflammatory gastritis. From its nature it is unlikely that regeneration to normal gastric mucosa ever takes place.

The *cause* of this peculiar gastric lesion is unknown. The problem is linked with the causation of achlorhydria in normal persons and in idiopathic hypochromic anæmia, where gastric analysis often reveals a secretory defect just as severe as in pernicious anæmia. When one considers that at least 15 per cent. of normal individuals over 40 have anacidity (Bloomfield and Polland 1933) the number which gets pernicious anæmia is minute. The same authors (1935) have followed 45 patients with complete achlorhydria for periods varying up to seven years; in no case has evidence of pernicious anæmia developed. *Age* is important: the tendency to achlorhydria increases with age and so does the incidence of pernicious anæmia (see also Goldhamer 1937). Any explanation for the relationship of anacidity to pernicious anæmia must take into account the remarkable *racial* incidence of the disease. Pernicious anæmia is pre-eminently a disease of Northern Europe and North America. Chinese and full-blooded negroes appear to be almost if not quite exempt. The *hereditary and familial* aspects must also be considered. As an example I might mention a family in which 3 cases of subacute combined degeneration and 2 cases of pernicious anæmia occurred in two generations, and two of the four sons of one of them had achlorhydria (Ungley and Suzman 1929; see also Wilkinson and Brockbank 1931). Frank (1933) describes identical twins who developed pernicious anæmia within 1½ years of one another.

Pernicious anæmia is not uncommon in association with *endocrine disturbances* such as toxic goitre, myxœdema, and diabetes, in all of which a high incidence of achlorhydria has been noted. The association however may possibly be accidental (Wilkinson 1933). Recent work of Dodds and his associates (1934–37) suggests a possible relationship between the posterior lobe of the pituitary, achlorhydria, and hyperchromic anæmia. On the other hand, Snapper, Groen, Hunter, and Witts (1937) describe cases which seem to link pernicious anæmia with the anterior lobe of the pituitary.

The diet prior to the onset of pernicious anæmia has often been deficient. Is there any evidence that *dietary deficiency* may give rise to achlorhydria? Webster and Armour (1934) have shown that in dogs vitamins A, D, and C do not appear to be

* The Goulstonian lectures for 1938, delivered before the Royal College of Physicians of London on March 3rd, 8th, and 10th. Lect. I appeared in our last issue.

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necessary for the proper functioning of the gastric glands. Achlorhydria is not a usual finding in human vitamin-A deficiency (Pillat and Chang 1932) or in beri-beri (Kitamura and Shimazono 1913). On the other hand, achlorhydria is extremely common in pellagra and a macrocytic anæmia may develop. Hellström et al. (1937) found achlorhydria more than three times as frequent in persons living on an unvaried lactocereal diet, deficient in the vitamin-B complex, as it was in those taking a larger variety of foodstuffs. On substituting the varied diet the achlorhydria usually disappeared. Miller and Rhoads (1935) report that feeding a canine-black-tongue-producing diet to swine led to achlorhydria, anæmia, and loss of the anti-pernicious-anæmia activity of the gastric secretion and liver. Nothing resembling the severe gastric atrophy present in pernicious anæmia has yet been produced by experimental diets. Nevertheless, the possibility exists that nutritional deficiency in prenatal or early postnatal life might give rise to lesions having a permanent effect on gastric secretion.

To recapitulate: the cause of the gastric lesion in pernicious anæmia is unknown. Age, heredity, and endocrine factors almost certainly play a part in its production. The possible rôle of nutritional deficiency, perhaps arising in prenatal or neonatal life, needs to be borne in mind.

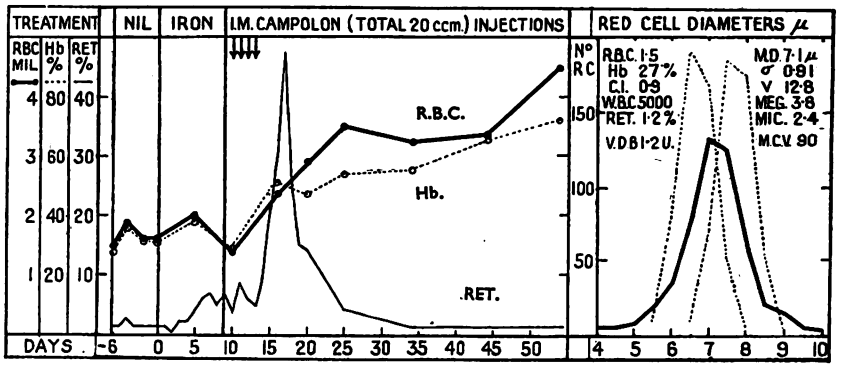

FIG. 1.—Illustrating the response to treatment in an anæmia due to dietary deficiency (see text). In this and the subsequent figures the thick line represents red blood-cells, the dotted line hæmoglobin, and the thin line reticulocytes.

Complete removal of the stomach in man is followed by "pernicious anæmia" in a significant proportion of patients surviving the operation for a year or more. I have described a case in which "pernicious anæmia" developed within five months of complete gastrectomy and splenectomy (Ungley 1932). The association between pernicious and related anæmia and diseases of the stomach is of great interest, although the significance of the relationship is not always clear.

Of 9 cases of benign adenomatous gastric polyp (Ungley 1935) 6 had pernicious anæmia. In some patients gastric symptoms appeared first, in others anæmia was the first symptom. In one case the father had died from pernicious anæmia. The commonest site for the tumours was the pylorus. All patients except 2 were over fifty years of age. Achlorhydria was present in the 7 who had test-meals. No extensive histological studies similar to those of Magnus have been carried out, but it would seem that these polyps develop most commonly in the mucosa of stomachs which have undergone or are undergoing the pathological process which gives rise to achlorhydria and pernicious anæmia. The occasional association of pernicious anæmia with carcinoma of the stomach is probably fortuitous (Wilkinson 1933).

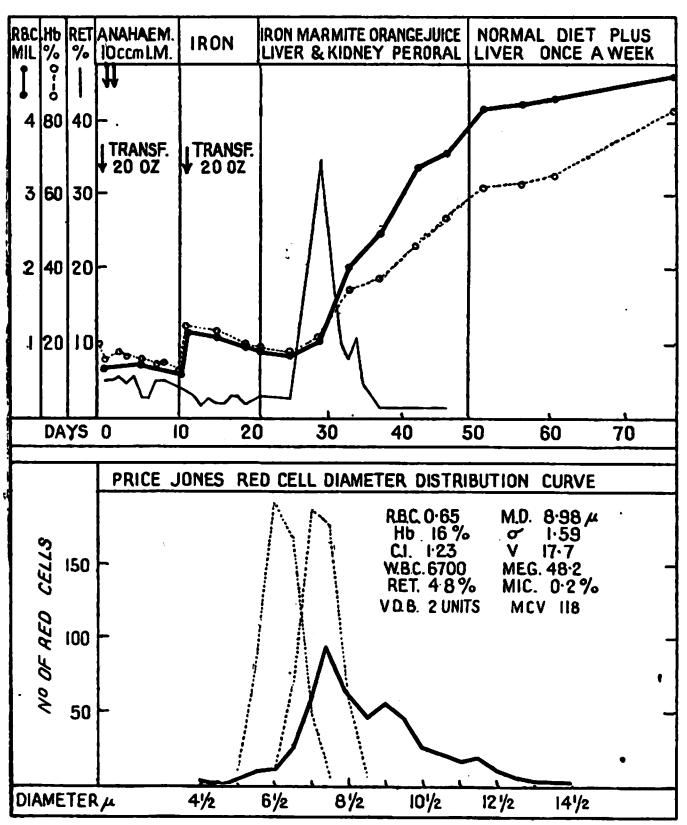

FIG. 3.—Hæmatological findings in a case of anæmia of pregnancy associated with vomiting and poor diet. The patient had suffered from hypochromic anæmia with achlorhydria after previous pregnancies. On this occasion the anæmia was macrocytic. After a normal confinement the anæmia became worse despite injections of campolon, and anahæmin was also without effect. Iron alone had no effect, but there was a prompt response to a high vitamin diet containing marmite, orange juice, liver, and kidney. Free hydrochloric acid was now present in the gastric juice.

THE EXTRINSIC (FOOD) FACTOR

In 1929 Castle described experiments which indicated that beef muscle recovered from a normal stomach after digestion for one hour had an effect similar to liver when administered to patients with pernicious anæmia. After confirming this observation I showed that raw sheep's stomach possessed slight hæmopoietic activity (Ungley 1929). At the same time others used pig's stomach which proved to be more effective. The muscle layer of the stomach probably provides most of the extrinsic factor in whole desiccated hog's stomach, but even the mucosa itself is not entirely free from it (Castle and Ham 1936).

The idea that a substance associated with the vitamin-B complex might play a part in the ætiology of pernicious anæmia probably originated in the work of Lucy Wills (1931). In certain tropical anæmias, often arising

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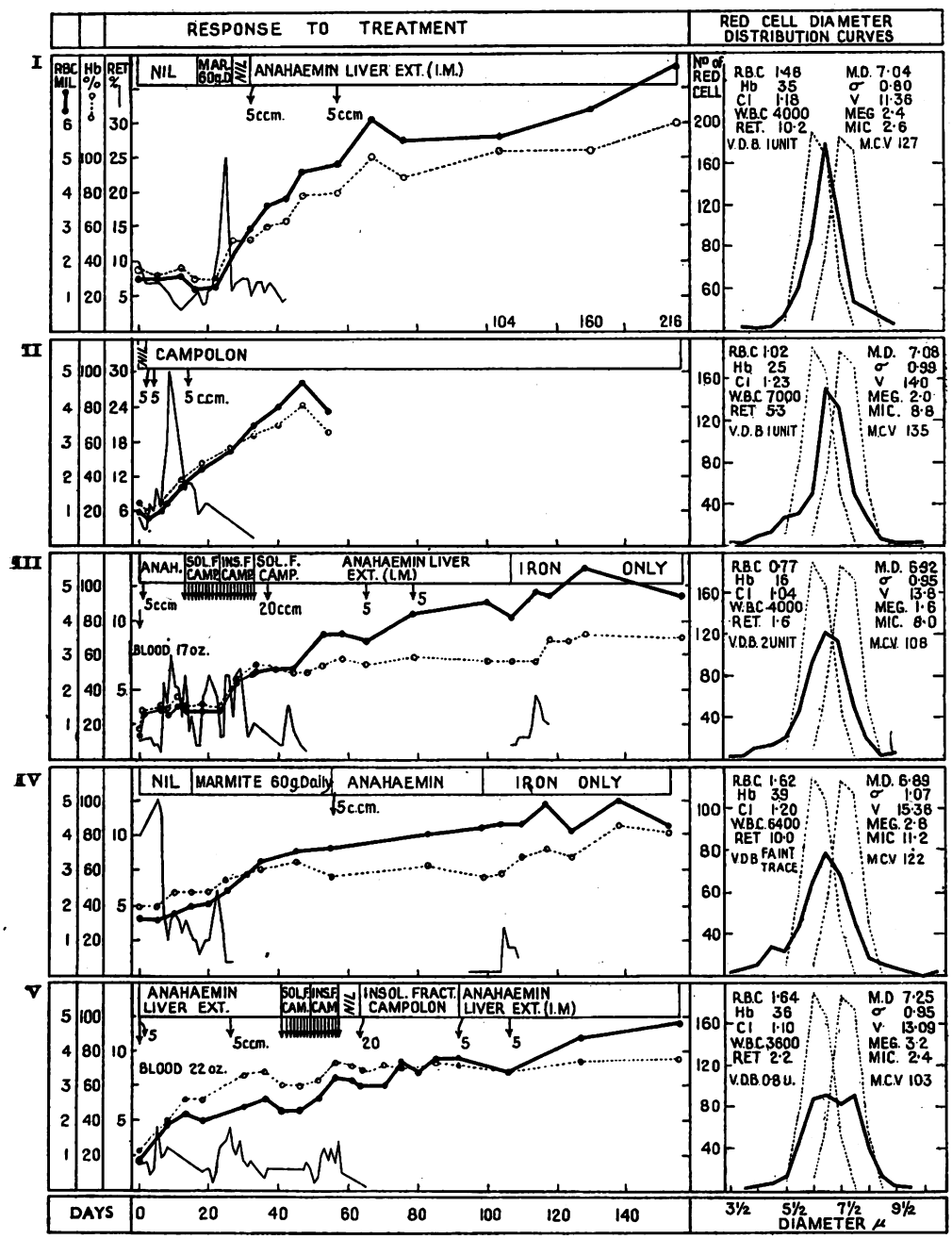
in pregnancy, and always associated with poor diets, Wills observed that autolysed yeast (Marmite) was as effective as liver extract. Later Strauss and Castle (1932) reported that autolysed yeast was a potent source of the extrinsic factor, which they suggested might be "vitamin B_2." My interest in the subject was aroused in 1930, when a reticulocytosis was observed during the administration of wheat-germ as a source of vitamin B_1 to a patient with subacute combined degeneration and pernicious anæmia. Although the reticulocytosis in this particular instance was almost certainly spontaneous, it was afterwards found that not only wheat-germ but also marmite and a 65 per cent. alcohol-soluble fraction of pressed brewer's yeast, when given in massive doses, induced a hæmopoietic response in some cases of Addisonian pernicious anæmia. Many of these patients had taken poor diets. Yeast extracts which influenced blood regeneration when given orally were inert when injected: to be effective, the active principle of yeast had to come in contact with intrinsic factor. In other words, the hæmopoietic effects observed were due not to a substance resembling liver extract but to Castle's extrinsic factor (Ungley 1933, Ungley and James 1934).

The presence of extrinsic factor in extracts of non-autolysed brewer's yeast has since been confirmed, using pylorus mucosa extracts as a source of the gastric factor. Activity attributable to the extrinsic



R.B.C.: red blood-cells per c.mm.

Hb.: hæmoglobin (100 % = 13·8 g. per 100 c.cm.).

C.I.: colour-index.

W.B.C.: white blood-cells.

RETIC. RET. } reticulocytes.

M.D.: mean diameter.

σ: standard deviation.

V.: variability.

MEG.: megalocytosis.

MIC.: microcytosis.

M.C.V.: mean corpuscular volume.

V.D.B.: van den Bergh.

g.: grammes.

mg.: milligrammes.

gr.: grains.

A.E.Y.: alcoholic extract of yeast.

I.M.: intramuscular.

HYPOCH.: HYPOCHRO.: hypochromic.

D.: daily.

ANAHA.: ANANÆM.: anahæmin.

S. INJ.: single injection.

TRANSF.: transfusion.

SOL. F. CAMP.: soluble fraction of campolon.

INS. F. CAMP.: insoluble fraction of campoion.

EXT. EXTR. } extract.

DIAM.: diameter.

FIG. 2.—Hæmatological findings and response to treatment in 5 cases of anæmia of pregnancy in whom there was a raised mean corpuscular volume but a normal mean diameter (see text)

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factor has also been found in rice polishings (Castle 1933), eggs (Singer 1932, Miller and Rhoads 1934), and possibly tomatoes (Groen 1935) and milk (Miller and Pritchard 1937). Liver (Reimann 1931) and the liver fraction G of Cohn (Fouts and Zerfas 1933) contain in addition to the fully formed active principle a considerable amount of the extrinsic factor. Reimann, Hemmrich, and Steiner (1936) found the extrinsic factor in liver fractions which were free from protein or polypeptides, so that it is evidently not protein-like in nature.

As already mentioned, Strauss and Castle (1932) postulated that the extrinsic factor might be vitamin B_2. This theory was opposed by a number of workers. Ungley and James (1934) found that "vitamin-B_2 concentrates" prepared from yeast were relatively ineffective as a source of extrinsic factor, whereas a fraction of marmite administered subsequently gave an excellent response. The hæmopoietic potency of the extracts bore no relation to their content of a factor which prevents dermatitis in rats, since called vitamin B_6. The result indicates that the extrinsic factor is not the vitamin-B_6 component of the vitamin-B_2 complex. Birch, György, and Harris (1935) have pointed out that the distribution of vitamin B_6 and of lactoflavine in foodstuffs is different from that of Castle's extrinsic factor. Also included in vitamin-B_2 complex is the human pellagra-preventing factor, now known to be nicotinic acid, the distribution of which in foodstuffs appears to be similar to that of Castle's extrinsic factor. Nicotinic acid injections in a case of macrocytic anæmia and sprue-like diarrhœa were without hæmopoietic effect, while the same material given by mouth led to a reticulocytosis without a rise of red blood-cells (see Fig. 4). In patients with pernicious anæmia receiving normal gastric juice or pylorus mucosa extracts as a source of intrinsic factor the simultaneous administration of nicotinic acid or nicotinamide (330 mg. by mouth) was sometimes followed by a slight hæmopoietic response of doubtful significance; in other cases the results were clearly negative. The possibility that nicotinic acid and nicotinamide may play some part in hæmopoiesis is not yet excluded, but it is evident that neither of these substances is the extrinsic factor of Castle.

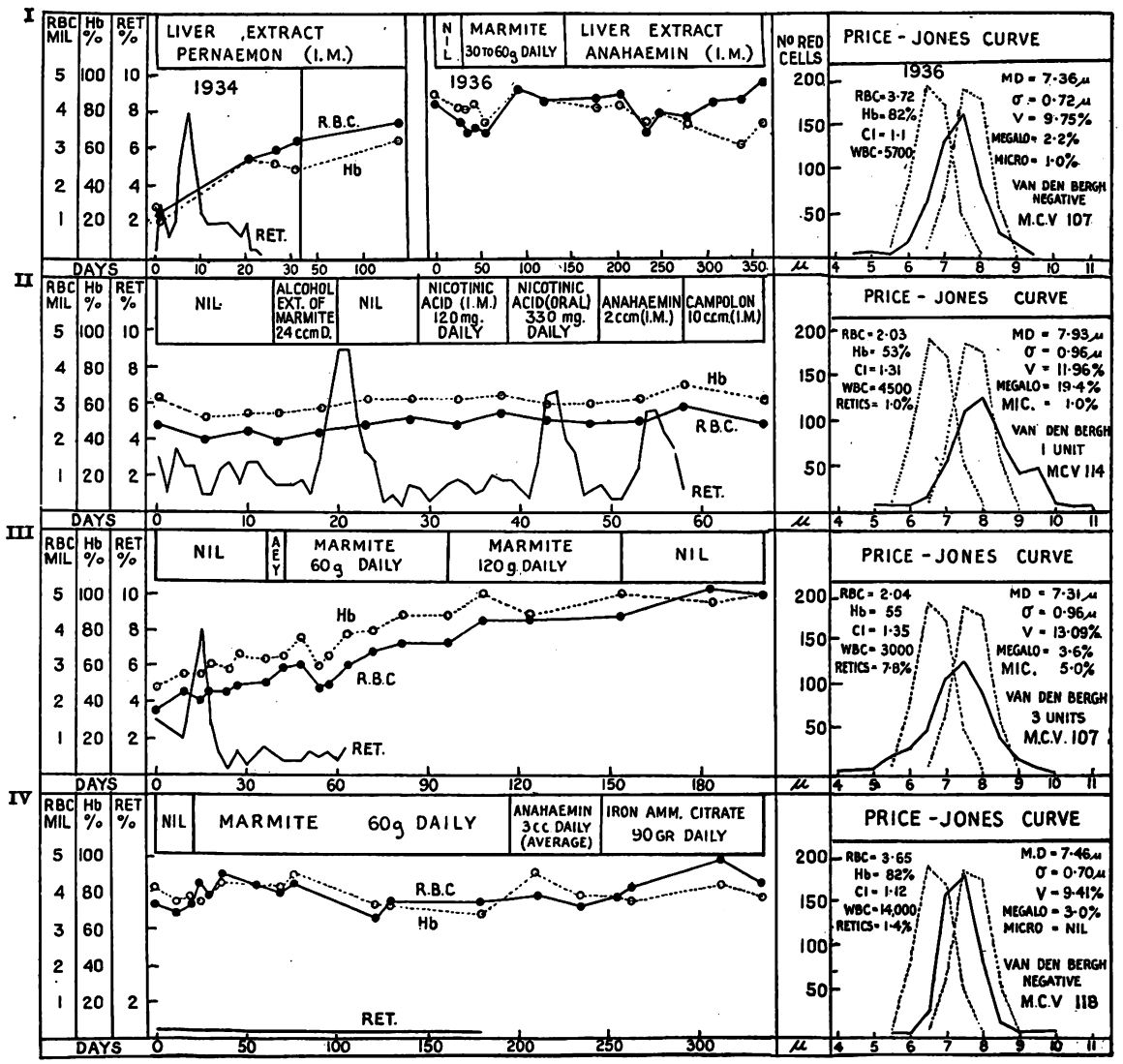

FIG. 4.—Hæmatological findings in 4 cases of idiopathic steatorrhœa. A raised mean corpuscular volume was present in each instance, but the mean diameter was normal in all except the second case (see text).

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THE INTRINSIC FACTOR

The intrinsic factor is readily destroyed by heat—e.g., by boiling for five minutes, or by heating to 70°–80° C. for half an hour (Castle, Townsend, and Heath 1930). It is not identifiable with hydrochloric acid, pepsin, rennin, or lipase. We have recently shown that it is not pepsinogen. At the same time we disproved Greenspon's theory that the gastric anti-pernicious-anæmia factor is a hormone effective alone if protected from the action of pepsin: depepsinised gastric juice and pepsin-free extracts of pylorus mucosa had no significant hæmopoietic effect unless interaction with a source of extrinsic factor was allowed (Ungley and Moffett 1936). The precise conditions necessary for the interaction of the food and gastric factors are not known, and the synthesis of a thermostable product identical with the liver active principle has yet to be accomplished (see Castle, Heath, Strauss, and Heinle 1937).

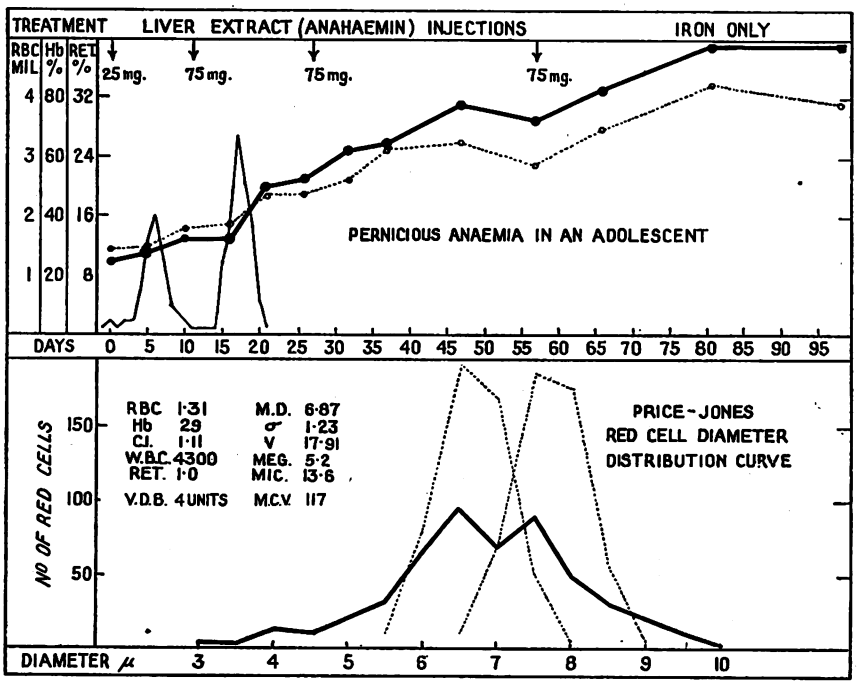

FIG. 5.—Hæmatological findings in a sexually immature girl aged 16. The clinical picture was that of pernicious anæmia with sore tongue and complete achlorhydria. There were no gastro-intestinal symptoms and the diet had not been grossly deficient. The mean corpuscular volume was raised (117 cubic micra) but the mean diameter was normal. Van den Bergh's indirect reaction 4 units. There was a tendency to hypochromia in the later stages of the remission induced by anahæmin.

Attempts to isolate the *liver principle* continue. By further purification of the product described by Dakin and West (1935) a peptide having twice the potency of the original fraction has been obtained (Ungley 1936, Dakin, Ungley, and West 1936). When given by mouth kidney is as potent as liver, and brain is about one-third as potent (Ungley 1931); yet fractions prepared from these organs by the technique used for making anahæmin showed no activity, suggesting that the active principle might differ from the liver factor. I have found, however, that the hæmopoietic potency of kidney is retained even after heating to 95°–100° C. for two hours, so that its activity cannot be due to Castle's intrinsic factor.

Macrocytic Anæmia from Dietary Deficiency

In work shortly to be published Wills has shown that tropical macrocytic anæmia usually fails to respond to highly purified extracts such as anahæmin. It would seem therefore that some mechanism other than deficiency of Castle's extrinsic factor is involved in the production of this anæmia (see also Wills, Clutterbuck, and Evans 1937).

Cases described as "pernicious anæmia with free hydrochloric acid" (see Alsted 1934, Groen and Snapper 1937) often have a long history of deficient food intake, and in some a hæmopoietic response to marmite or other source of Castle's extrinsic factor has been observed. I have already described two such cases: one patient was a widow aged 67, whose diet had been restricted because of epileptic fits; and the other a woman aged 39, with prolonged dietary deficiency due to dysphagia of the Plummer-Vinson type (Ungley 1933). A severe anæmia developed in a male epileptic aged 24, who restricted his diet chiefly to tea and white bread and butter-consuming almost no meat, eggs, fish, green vegetables, or fruit. A feature of the case was the Price, Jones curve, which showed considerably increased variability but a normal mean diameter. The mean corpuscular volume was in the upper limits of the normal range (90 cubic micra and, after iron, 99 cubic micra). Other findings are shown in Fig. 1.

The macrocytic anæmias of *pregnancy* form an important group. Five cases of interest are shown in Fig. 2. Sore mouth and vomiting occurred during pregnancy and often recommenced a few days after parturition. The diet had been poor both during the pregnancy and afterwards. In the third and fifth cases there was fever lasting about a week during the puerperium, apparently not due to sepsis, followed by further vomiting, sore tongue, and increasing pallor. In all these cases the mean corpuscular volume was raised but the mean diameter was normal. In a sixth case there was a Price-Jones curve similar to that usually found in Addisonian pernicious anæmia (Fig. 3).

Idiopathic steatorrhœa is another cause of macrocytic anæmia. The blood findings in 4 adults with fatty diarrhœa are shown in Fig. 4. The second case had the usual type of Price-Jones curve associated with macrocytic anæmia. The other three, although having an increased mean corpuscular volume, had a normal mean diameter. The fourth case, a man who had had gastro-enterostomy nine years previously, developed a sprue-like diarrhœa with nutritional œdema, anæmia, and hypochlorhydria; there was sometimes a leucocytosis (up to 18,000 per c.mm.).

In all the cases of nutritional anæmias above described, occurring in association with dietary deficiency, pregnancy, or idiopathic steatorrhœa, there was free hydrochloric acid in the gastric juice. Bone-marrow obtained by sternal puncture in a

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few instances showed an erythroblastic activity often not of pernicious anæmia type. The results of van den Bergh's test and the total white cell count were much the same as in pernicious anæmia, and the tongue changes were similar. There were no nervous manifestations. In some cases the anæmia responded to marmite; in others to Campolon or to anahæmin. About half the cases later developed hypochromia which responded to iron. A factor common to 9 out of these 11 cases was a normal mean diameter (though with increased variability) in the presence of a raised mean corpuscular volume—that is, the cells were more spheroidal than normal. Such spherocytosis has been observed in malaria, and is well recognised in acholuric jaundice (Vaughan 1937). Fragility curves carried out in several of the pregnancy cases showed, however, little or no deviation from normal. A similar spherocytosis was present in two cases of macrocytic anæmia in young persons with achlorhydria. One was a small sexually immature girl of sixteen (Fig. 5) and the other a young woman of twenty-five (Fig. 6). Although about half of these cases later developed hypochromia there was no clear indication that iron deficiency was responsible for the absence of an increase in mean diameter. The administration of iron at the commencement of treatment in one of the cases (see Fig. 1) led to an increase in mean corpuscular volume but was without effect on the mean diameter or on the form of the Price-Jones curve. It is evident that the factors giving rise to this variety of macrocytic anæmia require further study.

Macrocytic anæmia can arise from *intestinal stenosis*, intestinal anastomoses, &c. (see Meulengracht 1929). Hydrochloric acid is frequently present in the gastric juice, and the presence of Castle's intrinsic factor has sometimes been demonstrated. Rhoads and Miller (1937) have observed that, in animals fed a deficient diet, indol or toxins produced by intestinal obstructions lead to hæmolysis and macrocytic anæmia.

A man aged 50, who had stenosis of the gut following intussusception in childhood, showed typical idiopathic hypochromic anæmia with smooth tongue, spooned nails, and achlorhydria in 1934. He had taken a normal diet and there was no evidence of bleeding. In 1937 the stenosis was short-circuited by entero-anastomosis but periodic attacks of diarrhœa continued. Nine months later the blood picture had changed to that of pernicious anæmia. After a hæmopoietic response to liver extract iron deficiency again became evident in a falling colour-index (Fig. 7).

The Anæmia of Iron Deficiency

The factors which give rise to iron deficiency and hypochromic anæmia are the same in principle as those which give rise to other deficiency states. Iron deficiency arises in children through increased demands of the tissues during rapid growth, inadequate supply of iron from the mother, diets poor in iron, and gastro-intestinal disturbances interfering with absorption. Infants of small birth-weight are especially liable to develop hypochromic anæmia. Infections increase the need for iron and by a vicious circle iron deficiency increases the susceptibility to infections (Mackay 1935). In girls after puberty hypochromic anæmia may develop as a result of the combined demand for iron of growth and menstruation together with diets poor in iron. In idiopathic hypochromic anæmia, which is usually seen in women between the ages of 25 and 50, menorrhagia is extremely common. Other factors giving rise to the anæmia include diets poor in iron, multiple and frequent pregnancies, and gastro-intestinal disturbances associated with achlorhydria. Hypochromic anæmia is common after gastric operations and also in hookworm infection (see Rhoads, Castle, Payne, and Lawson 1934). Blood loss is the factor of primary importance in idiopathic hypochromic anæmia (Heath and Patek 1937) and the syndrome is rare in men. Occasionally,

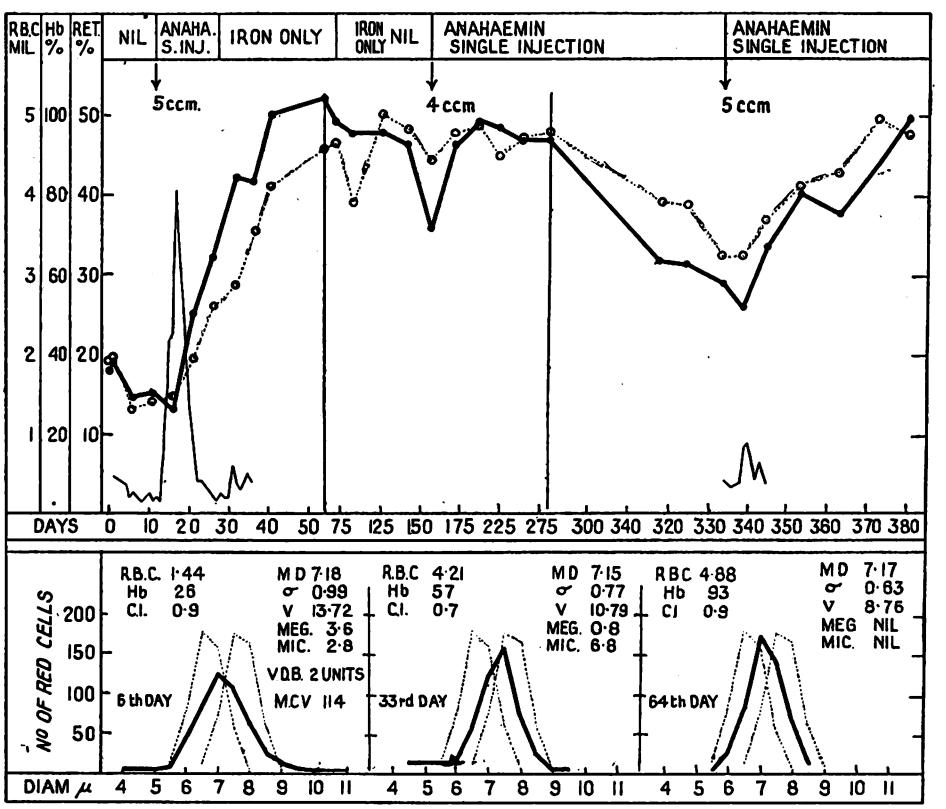

FIG. 6.—Hæmatological findings in a woman of 25 who had formerly suffered from hypochromic anæmia. Menstruation was heavy and the diet was poor. The mean corpuscular volume was raised (114 cubic micra) but the mean diameter was normal. Van den Bergh's indirect reaction 2 units. After a good response to anahæmin the colour-index fell. The administration of iron caused a small secondary reticulocyte peak, the significance of which was difficult to assess, and the colour-index gradually rose almost to unity. The Price-Jones curve became normal. Liver extract is required at infrequent intervals. There has been no return of free hydrochloric acid.

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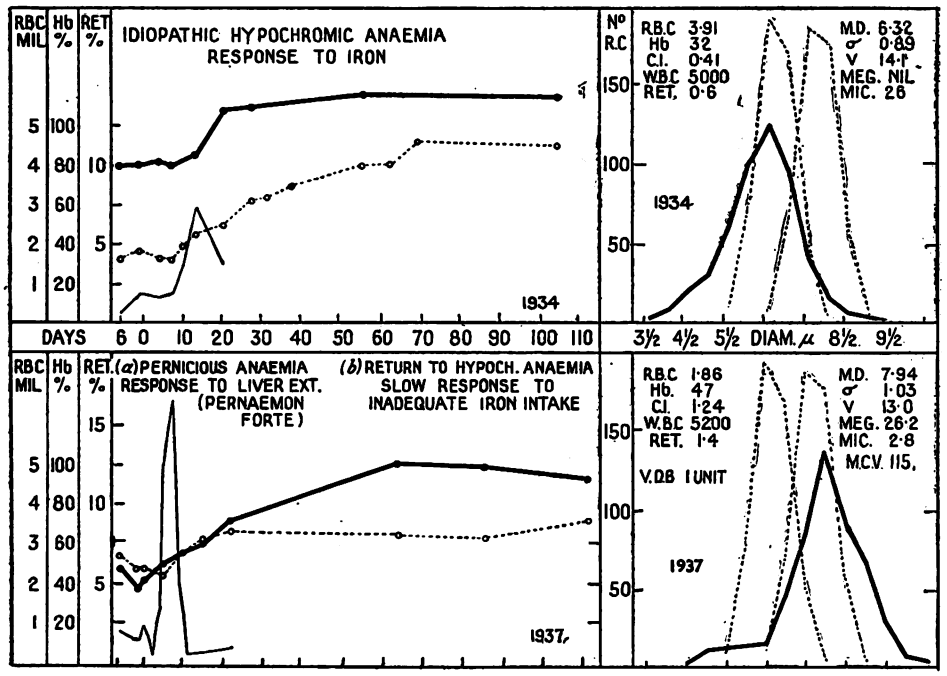

FIG. 7.—Blood findings in a man with intestinal stenosis following intussusception in childhood. A change from idiopathic hypochromic anæmia to pernicious anæmia is illustrated.

however, idiopathic hypochromic anæmia occurs in an adult without any evidence of iron loss, as for example in a miner, aged 45, who gave no history of bleeding, and whose stools were free from occult blood. There was histamine-refractory achlorhydria, and the diet contained no meat, green vegetables, or fruit. A man with intestinal stenosis showed the typical picture of idiopathic hypochromic anæmia in the absence of any history of bleeding or dietary deficiency (Fig. 7). About 80 per cent. of cases of idiopathic hypochromic anæmia with or without dysphagia have a complete histamine-refractory achlorhydria. There are cases intermediate between idiopathic hypochromic anæmia and pernicious anæmia, and cases which change from one to the other. Examples have already been described (see also Fig. 8). Barer and Fowler (1937) observe that achlorhydria decreases the retention of iron from a normal dietary intake of iron, but does not influence the retention when large amounts of medicinal iron are administered by mouth. The addition of hypochromic acid does not increase the retention of iron with either a high or normal intake of iron. Small amounts of iron given by mouth, although retained by the body, may have little effect on hæmoglobin regeneration, whereas larger quantities bring about rapid regeneration (see Fowler and Barer 1937, Brock and Hunter 1937). The explanation of this need for large doses is not known; it does not apply to iron given parenterally which, although liable to cause toxic symptoms in adequate dosage, can be utilised quantitatively in the production of hæmoglobin (Heath, Strauss, and Castle 1932).

The utilisation of small amounts of iron by mouth is sometimes increased by the simultaneous administration of chlorophyll, bile pigments (Patek and Minot 1934), and Whipple's secondary anæmia fraction of liver. Copper is sometimes of value in increasing the utilisation of iron in infants. Large amounts of marmite, dried yeast, and wheat-germ have no effect on hæmoglobin regeneration when given alone in idiopathic hypochromic anæmia (Ungley 1933), and no convincing evidence has been put forward that such vitamin B-containing substances will increase the utilisation of iron. Provided sufficient doses of iron are given there is rarely need for any of these supplements.

Some patients announce that they are quite unable to take iron in any form, alleging that it gives rise to gastric or other disturbances. A woman of 44 had for eleven years defied efforts to induce her to take iron. By first giving a simple syrup and then adding to it gradually increasing doses of iron without her knowledge it was possible to bring about complete

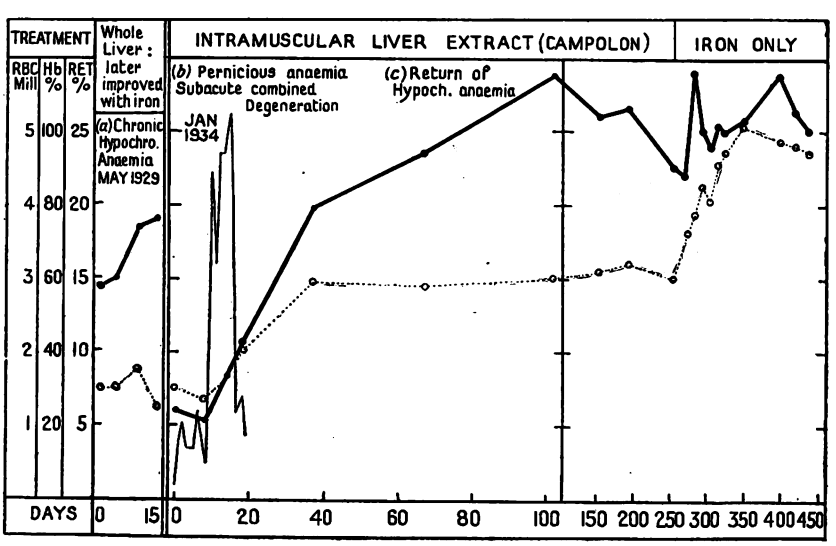

FIG. 8.—Blood findings in a woman showing a change from chronic hypochromic anæmia to pernicious anæmia, and a return to hypochromic anæmia after treatment with liver extract. This case is exceptional in that it was subsequently possible to discontinue both liver extract and iron. She has now been without liver extract for 3½ years, and has not had iron for 1½ years, but nevertheless remains in excellent health with normal blood findings.

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recovery without the gastric symptoms which had caused trouble on former occasions. A second patient, a hospital nurse, immediately recognised the addition of iron to a medicinal mixture, but later failed to realise that she was receiving increasing quantities mixed with marmite.

Myxœdema.—Vitamin-C Deficiency

The anæmia of *myxœdema* is sometimes the direct result of lack of thyroxine and is then gradually relieved as the basal metabolic rate returns to normal under the influence of thyroid treatment. In other instances, however, the anæmia appears to be secondary to the achlorhydria which is a frequent finding in myxœdema. In such cases the anæmia may be either hypochromic and require iron, or more rarely it may be pernicious in type and respond to liver therapy.

Deficiency of vitamin C.—Anæmia is a frequent finding in infantile scurvy. About 70 per cent. of cases of adult scurvy show anæmia of greater or lesser degree. A reticulocyte response to vitamin C has been recorded by some workers. In three cases of bachelor scurvy observed by me there was a spontaneous reticulocytosis, and I was unable to demonstrate the specific effect of ascorbic acid (see Fig. 6 in Lect. I).

Conclusion

The anæmias of deficient nutrition, like the avitaminoses, are the result of the variable participation of a number of factors affecting the intake, absorption, and utilisation of essential food factors. Treatment consists in supplying the missing substances in amounts sufficient for the needs of the individual. Reference to the neurological manifestations of anæmia will be made in Lect. III.

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GONORRHŒA IN WOMEN AND CHILDREN *

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GONORRHŒA is one of three diseases—the others being syphilis and tuberculosis—in which the patient is more apt to be pleased with the progress of her condition than is the doctor. My experience, now extending over twenty years, confirms that of others, however, in leading me to regard as unduly pessimistic the attitude that gonorrhœa is incurable. This pessimism has arisen mainly from the chronicity of the disease and from the need for medical supervision and testing long after the patient has ceased to have symptoms. I propose to discuss not the academic or the public health aspects of gonorrhœa but the disease as one sees it now in hospital and in private practice.

SIGNS AND SYMPTOMS IN ADULTS

The diagnosis of gonorrhœa is nowadays made by films and cultures, both urethral and cervical, and by blood complement-fixation tests in cases with more than ten days' history of discharge. At *some* time in the treatment of every case of gonorrhœa careful rectal examination and tests are required. Surprisingly large numbers of patients with no rectal symptoms are found to be carriers of gonococcus in the lower rectum.

Cases with bowel symptoms should always be investigated at the first visit. I have now seen several cases of subacute gonoccocal proctitis, previously treated elsewhere as cases of colitis. Symptoms are much alike—constipation alternating with diarrhœa, abdominal pains—sometimes acute attacks along the whole area of the colon, and discharge of muco-pus or of pure pus and blood per rectum. On examination definite proctitis is found, with muco-purulent discharge. Films and cultures

*Abridged from a communication to the London Association of the Medical Women's Federation on March 22nd, which will appear in full in the *Quarterly Review* of the Federation.

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show gonococci in large numbers. In some of these cases there is severe pain on defæcation also. It is, however, improbable that in a case of gonorrhœa under treatment such symptoms would not at once suggest a rectal extension. The cases more likely to be missed are the cases of rectal infection (no doubt from discharge dropping back in the course of treatment), which are often quite symptomless.

In gonorrhœa of acute or subacute type the urethra is infected in almost 80 per cent. of all adult women, and is usually reddened. Though on careful sub-urethral massage, along the last inch of the vagina, pus or gleet, sometimes blood and pus, can be expressed from Skenes's ducts, many patients with urethritis make little or no complaint of pain. Urethræ may be infected when there is no outward sign of inflammation.

Vulvitis may lead to burning sensations, tenderness, and pruritus, and if neglected vulval warts may develop.

A common vulvar complication is a *Bartholin abscess* on one or both sides, due to infection of cystic swelling, and this area must always be palpated carefully to exclude infection. If an abscess is present only free incision under a general anæsthetic is of real value. Otherwise one sees cases giving the patient no pain or discomfort but having a residual sinus, from which a drop of pus is easily expressible. This pus shows numbers of gonococci, and is therefore a chronic focus of infectivity.

The severity of gonorrhœa varies from extremely mild symptoms, inconveniencing the patient so little that she may not seek advice till her consort accuses her of infecting him, to the patient who is toxic with the infection from the very start and most acutely ill.

Cervicitis is usually seen where there has been complete coitus: and the typical gonococcal cervicitis consists of an erosion tending to bleed, and with thick tenacious muco-pus attached. The vagina is said to be infected only as a secondary infection, showing *vaginitis*—i.e., granular or warty. But King and Mascall (1935) of the Whitechapel clinic have demonstrated the presence of gonococci in the vaginal fornices, where there were no symptoms of vaginitis.

Local extensions may be to the bladder, causing acute cystitis: and the symptoms vary, depending on the acuteness of the infection, from painful frequent micturition to agonising tenesmus, in which only a drop or two of blood-stained urine is expressed after each painful effort. Extension to the *endometrium* and to the *tubes* is far from uncommon. Where the endometrium is involved the amount of muco-purulent discharge is usually greatly increased. Classically, also, there is menorrhagia, but this is by no means always met with. Extension to endometrium and to the tubes takes place most frequently either after a period (or even during a period) or alternatively early in the infection, where exposure to infection has taken place while greatly under the influence of alcohol. The virulence of some of these cases has to be seen to be believed.

A considerable number of these cases of salpingitis and even of pyosalpinx resolve with expectant treatment. But where resolution is not complete, as evidenced by repeated attacks of pelvic pain when the patient is about again, or by early and heavy menstrual loss, surgical intervention is, in my opinion, essential.

Extension to the *peritoneum* may occur in a case of acute pyosalpinx; evidence of this is to be found in the adhesions present at operation. It is amazing how few symptoms and how little pyrexia one sees in these cases, after the 24 or 48 hours of acute pain has subsided. In fact, quite often the patient with a huge tubo-ovarian abscess easily palpable, and held down by adhesions, may complain only of perhaps a little pain when the bowel moves; and various patients have tried to explain to me by elaborate painless gymnastic exercises, that I must be wrong to think there is a lump inside.

Warts of the vulva are best treated by excision under a general anæsthetic, with stitches inserted where required. Recovery is complete and there is hardly any post-operative pain if the area involved is dressed with flavine in sterile paraffin. It is important to keep these cases as dry as possible before and after operation; and on that account I prefer the urethral and cervical infection to be cleared up, or nearly finished, before the warts are excised. Occasionally, however, the warts disappear in the course of treatment if kept dry and dusted well with compound Dermatol powder or something similar. I have seen warts disappear during vaccine therapy. Treatment of warts by cautery is never very successful in my experience; usually small ulcers result, and these tend to heal slowly and to be very painful.

A very purulent and frothy type of vaginal discharge is found in cases infected by *trichomonas*. This flagellate organism, as is well known, is sometimes an inhabitant of the rectum; and as with *B. coli*, so with trichomonas, a cervical and vaginal infection may easily follow. I mention this organism because it is usually thought that trichomonas infection exists alone; but King and Mascall (1936) have shown that in 59 per cent. of a series of 300 cases the gonococcus coexisted in this infection. It is of course more difficult to isolate till the severity of the trichomonas infection has been subdued by administration of Devegan, or vaginal Stovarsol (both pentavalent arsenical preparations) or by insufflation with silver picrate powder. After that, in a certain proportion of cases the gonococcus is more easily demonstrable, and treatment can then be instituted. In the remainder the discharge and symptoms are due to trichomonas alone. Trichomonas infection is not uncommon in pregnancy.

Metastatic complications of gonorrhœa known to us all are arthritis, tenosynovitis, and iritis. Much less commonly pleurisy or pericarditis is met with; meningitis is never present save as part of a general gonococcal septicæmia following infection with a virulent strain of gonococcus. Joint involvement is usually a simple though painful arthritis, with effusion of fluid; acute septic gonococcal arthritis, requiring operation, is rare. Tenosynovitis and iritis occur usually in chronic or subacute gonorrhœa where there has been no treatment or quite indifferent treatment, and these lesions are precipitated by strain and stress and chills. The blood complement-fixation test is said always to be positive in these cases.

The possibility of gonorrhœa as an underlying focus should never be forgotten in ordinary medical cases of arthritis. The joints most frequently involved are those of wrists and hands, of knees, ankles, and feet, depending on the type of work done by the patient. For example, those with heavy manual work, like the scrubber and laundry worker, are more likely to have the hands and wrists involved; the woman who stands or walks a great deal, and who is also exposed to damp and cold—i.e., the shop assistant, waitress, and above all that product of our times the canvasser from door to door or the demonstrator of labour-saving household goods—tends to severe

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arthritis or tenosynovitis of the lower extremities. The amount of arthritis varies, I believe, with the severity of the climate: it is relatively rare in the Royal Free Hospital clinics. The last group of gonococcal arthritis there were all transferred from the medical wards or out-patients' department; of four of these cases in together, only one had ever had any treatment for gonorrhœa, and from that she had lapsed many years before. At the same time I must admit that the most acute case of multiple gonococcal arthritis that I have ever seen accompanied an acute urethritis and double pyosalpinx following delivery, in a case sent on to us from another hospital after the presence of ophthalmia neonatorum in the baby had led to diagnosis of the mother's condition.

GONORRHŒA IN CHILDREN

Gonorrhœa is in the overwhelming majority of cases due to indirect infection from towels, sheets, and sanitary appliances in use by an infected and careless adult. Direct *vulvo-vaginitis* infection, due to criminal assault, is relatively rare. I have seen a couple of children, aged 10 and 11 years, suffering from gonorrhœa due to direct sexual intercourse, for which they received payment in money and of which they boasted. Such unnatural precocity is fortunately uncommon, and is of course only the product of a degraded home where the mother is indifferent to the point of criminality.

The other direct infection in gonorrhœa of children is *ophthalmia neonatorum*, attributable in 90 per cent. of all cases in England to the gonococcus in the mother's cervix or vagina. I do not propose to deal with this question now, but merely wish to state that the notification numbers of ophthalmia neonatorum are falling but very little: this means, I fear, that a considerable number of cases of gonorrhœa in women are going without treatment; 100–120 cases are being notified every week in England and Wales this year. There is not nearly so much blindness now from ophthalmia neonatorum as there was once in the London area; this is partly owing to the admirable treatment given by St. Margaret's (L.C.C.) Hospital in such cases. But the fact remains that it is not creditable that so many weekly notifications should still occur. No doubt notification is far more complete now than it was in the past, and in that way the incidence may well be less than it appears to be. But the numbers are still far too large.

Gonococcal vulvo-vaginitis in children is, as all know, a great source of worry and also of infection, as the infected and undiagnosed child may rapidly spread infection through a children's ward or a school. Apart from the public health aspect, the problem has been, till recently, a very disheartening one owing to the frequency of relapses. The most modern treatment of such cases consists (in addition to local irrigation, vaginal packs, and vulvar sitz-baths) in administration by mouth or by injection of an œstrin preparation—e.g., Menformon, of which a tablet of 3000 units may be given once or twice daily. Mostly the purulent discharge clears up rapidly, and often negative tests are got much earlier than by older methods of treatment. Critics of this method say that the children suffer from pelvic congestion, which causes an aggravation of the tendency to masturbate.

Dr. Anwyl-Davies has observed gross mammary development following this treatment, but Dr. Kathleen Brown (1935) and Dr. D. Nabarro (1935) have both spoken in its favour, and my own much more limited observation has proved its usefulness. The other medicament to cut short infection is Prontosil album: 1 gramme to 2 grammes, carefully spaced out into four doses, may be given to children over 18 months, with due precaution against poisoning. A problem arises when the child returns home. Has the original focus of infection been cured and are the child's sanitary needs adequately looked to? Most do their very best, but poverty and overcrowding make their best very much less good than medical care requires, and a small proportion of children suffer relapse or reinfection on their return home.

Dr. Brown reports that at the Children's Medical Home, Waddon (a home for girls aged 3–14 years), prontosil album was used in treating twenty cases of gonococcal vulvo-vaginitis from September to November, 1937. The dosage given amounted to a total of 15 to 45 g., eleven cases receiving over 20 g. The immediate clinical response was excellent in all cases but one, and the majority were free from purulent discharge after two or three days. Eighteen cases have had no clinical or pathological relapse over a period of 16 weeks or longer. The remaining two cases were failures. Four cases showed signs of intolerance and the drug is now given in a total dosage of 15 g. for children under 56 lb. and 20 g. for those over 56 lb. in weight. Dr. Brown points out that the great advantage of the sulphanilamide preparations is that local treatment is reduced to a minimum and mostly consists merely of swabbing and painting for ten days.

Tests of cure in children are no less rigorous and stringent than they are in adults. Here again rectal tests are essential, as a considerable proportion of children have infection of the rectum with—or without—symptoms.

As the infected child may suffer from all the complications of the adult gonorrhœa—Bartholin abscess, arthritis, iritis, even, though more rarely, salpingitis—it is easy to see how urgent is good treatment for infected small girls, and how isolation from other children is of paramount importance till they are pronounced cured.

TREATMENT

Local and medicinal.—The essentials for treatment are rest, satisfactory drainage of uterus, local treatment by sitz-baths, douches, and other treatments, and oral medication. The public believe that *the* treatment of gonorrhœa is douching—and douches, self-administered, of one pint of soap and water, or of permanganate, or of some other antiseptic are sometimes given by patients to themselves thrice daily. The result is bleaching of vulva and vagina, a waterlogged condition of the vaginal wall, and continuous desquamation of epithelial cells. The pathological conditions are naturally untouched by this ineffectual meddling.

Ideal treatment consists of a great deal of *rest*, where possible in bed. Where this is out of the question, as it often is, by going to bed early: and by staying in bed when possible—e.g., on Sundays, most of the day. But certainly cycling, walking, swimming, and dancing are completely forbidden. When patients ask what they *can* do, one suggests needlework, learning a new language, taking up a musical instrument of modern type, and so on. If the urethral test is gonococcus positive, a urinary antiseptic is indicated, as is of course the case where there is bladder involvement with frequency and pain. As a rule patients are very comfortable on an alkaline mixture—pot. cit. with sod. bicarb.—

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whether there are bladder symptoms or not; and the alkalinised patient seems to improve rather faster. Regular bowel evacuation is of paramount importance; the average hospital patient is badly constipated, and no one who has not tried it can imagine the hopelessness of clearing up a discharge where the rectum is chronically loaded. No treatment will remove the superimposed heavy *B. coli* (proteus) infection save regular bowel action by diet and drugs—or in severe cases by colonic lavage too.

Diet is of great importance. Everyone knows that alcohol, black coffee, and curries (to put it briefly) are forbidden while gonorrhœa is being treated; but on the positive side a good generous diet, including milk, eggs, butter, and plenty of fresh fruits and salads, helps a patient to recover much more quickly. This can be given to the *unmarried* girl in our hostels; but, sadly enough, the innocently infected wife of the poor man has an indifferent diet, short of nourishment and vitamins. The unduly stout woman or girl, on the other hand, recovers slowly from gonorrhœa and is prone to boils, intertrigo, and warts. She must be dieted and her endocrine deficiency, if present, must be dealt with.

Douching and painting.—Local douching is required only for severe purulent discharge or for relief of pain, and should be done by a trained nurse. I do not believe that any woman can douche herself well. We all tend to keep a patient too long on douching, though patients often ask to be put back on it when it has been discontinued. After the massive purulent discharge is gone better treatment consists in cleansing the cervix well with a saturated solution of sod. bicarb. or 10 vol. H_2O_2 and treating it with probes as far into the endocervix as can be reached, with protargol and glycerin 10 per cent., or with glycerin only, or glycerin in combination with boric, or acriflavine, or glycerin Dettol. Unless there is a distinct erosion the cervix should be dried gently and left; in acute inflamed cases a small tampon soaked in glycerin may be placed against the cervix, or a light pack of 1 inch ribbon gauze soaked in a glycerin compound. Save in cases of acute cervicitis the vagina should in my opinion be kept as dry as possible.

Medicines.—Where there is cystitis sometimes the mist. pot. cit. with hyoscyanus or buchu does not give relief. In some of these cases Pyridium tablets, 6 or 8 daily, give comfort; some patients do best on a mandelic acid preparation. I have found Boots' Neoket admirable in some of these cases. Opiates or other sedatives may be required during the first 48 hours of treatment.

The greatest medicinal progress in the treatment of gonorrhœa has resulted from the administration of prontosil album in doses of 3·5–4 g. daily, given with an acid or an alkaline mixture depending on the vaginal *p*H. In the main the results are in the highest degree encouraging, and the clinical and pathological improvement is in some cases dramatic. The burning and itching of acute vulvitis stops at once. This large dosage is continued where tolerated for seven days (the toxic signs and symptoms liable to be caused by this drug are now well known and must be watched for); then for another week or so half the amount is prescribed—the tablets to be spread well over the day, the last tablet to be taken at bedtime. The drug must be stopped forthwith should any very untoward symptoms or signs arise, but this has happened only once or twice in our department.

Vaccines and antitoxin.—When patients are intolerant or cannot be kept under close medical supervision I use in ambulatory cases a vaccine or gonococcus antitoxin. I have found the latter very useful in a number of cases during the past 18 months, but have observed rather more complications following its use than Anwyl Davies seems to have found, varying from intense pain and irritation at the seat of infection after the fourth or fifth dose, to pyrexia associated with inguinal adenitis, and in one case a dramatically severe serum rash—this even though each dose was invariably "guarded" by 4 or 5 minims of adrenaline.

Heat therapy.—The treatment of gonorrhœa and its complications by heat electrically or chemically produced is now an old story. I have found diathermy treatment very useful, particularly in the urethra and rectum. More recently we have been able to relieve the pain of salpingitis, or sometimes pain following salpingectomy, by the use of the Elliott machine. This consists of an applicator of latex attached by two rubber tubes to a small machine with electrically heated water: the temperature of water is shown by a thermometer, and the extent of the pressure by a regulating instrument to the left. This machine brings much comfort to most patients. The temperature of water in the latex bag is usually about 116° F. at the beginning. The patient lies with the applicator in the vagina and the temperature is allowed to rise to 128° F. The treatment lasts for an hour at a time, and the relief from pain is so great that some of our patients fall asleep on the couch during the treatment. Twelve to twenty-four treatments are given, daily; pain is relieved and the menstrual loss and rhythm becomes normal, or nearly so. Final treatments, which I must mention very briefly, are by artificial pyrotherapy. In the past I have often been forced to use protein shock treatment to start resolution of a chronic resistant case of gonorrhœa. As the results of sulphanilamide are now found to be as good in chronic and in subacute gonorrhœa as in the acute condition, protein shock treatment may soon become outmoded.

Since it is held that for resistant types of gonococcus a temperature lower than 105°–106° F. is useless, the "Kettering Hypertherm" has been used in America for some time. The patient is wholly (save for the head) introduced into a machine which electrically produces the required temperature. The patient is under continuous medical and nursing supervision during the whole treatment, which lasts for 5 hours at 105°–106° F. Several hours are spent slowly rising to this temperature and falling to normal again, so the process lasts 12 hours. This machine is not in general use in England, though I believe that St. Bartholomew's Hospital have a machine, and I know of one private electrotherapist who uses one. A film demonstrating the results of the use of the Kettering Hypertherm, in advanced cases of syphilis and in gonococcal arthritis, is impressive.

TEST OF CURE

Finally, one may ask "and what is the test of cure?"

The minimal satisfactory tests consist in negative films and negative cultures taken just as three menstrual periods end, the last at least after a month without treatment. The last tests must be taken after a provocative painting, or best of all after a heavy dose of alcohol the night before the tests. In addition the blood complement-fixation test should be negative and the patient's clinical condition must be free from all signs and symptoms of infection.

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The use of cultures is essential. At our own V.D. pathological laboratory at the Royal Free during 1937, in 517 cases films and cultures were both positive; in 31 cases films were positive, cultures negative; while in 323 cases where films showed *no* gonococci cultures grew the gonococcus beyond a doubt. This indicates, I think, that though in many cases the best person to treat the patient suffering from gonorrhœa is her general practitioner, because in this way she retains contact with her best medical friend and does not feel the horror which sometimes overwhelms the sensitive patient attending hospital, he must use not his impressions but the most rigorous laboratory tests as tests of cure. If these are not persevered with till they are completely satisfactory, no more will have been done than to add to the number of cases of chronic gonorrhœa, and the unmarried girl who finally marries may find later, to her cost and sorrow, in the words of Mr. Johnston Abrahams, that "the most sensitive media for test of cure are the urethra of the husband and the eye of the child."

OBSERVATIONS ON THE CELLULAR BASIS OF THE GORDON TEST FOR LYMPHADENOMA

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The discovery that an encephalitogenic agent was present in the lymph nodes from cases of lymphadenoma was first made by Gordon (1932). He showed that suspensions of such material after intracerebral inoculation into rabbits produced a peculiar condition of paralysis and ataxia, which resembled that due to the encephalitis of known virus diseases. It appeared that this encephalitogenic power was a specific property of lymphadenomatous glands and could be used as a diagnostic test in the disease. Several observers have employed it successfully in this manner (Gordon 1933, Van Rooyen 1934, Chapman 1936, Goldstein 1936, Rosenberg and Block 1936, and others).

When Friedemann and Elkeles (1933) found that a similar effect on rabbits could be produced by injecting suspensions of human marrow and spleen, this naturally threw doubt on any theory that the encephalitogenic agent was a virus. Although this belief appears to be no longer held, yet the nature of the agent has not been decided and its relationship to lymphadenoma remains mysterious. It is usually regarded as a chemical toxin or enzyme and appears to be confined to certain cells, from which it is liberated by autolysis. The experiments that will be described in this paper were carried out to discover which type of cell contained the agent. Human cells have been used and also the tissues from certain animals not previously tested. At the same time histological examinations have been made of the brains of the experimental animals and the histological changes induced have proved a reliable test for the agent.

DISTRIBUTION OF THE AGENT IN HUMAN TISSUES

Examination of normal tissues by Friedemann (1934) and Kelser and King (1936) for the presence of an encephalitogenic agent showed that positive findings were only obtained with bone-marrow and spleen or with leucocytes. This suggests that the agent is associated either with one type of leucocyte only, or perhaps with more than one type and also with the immature forms and allied cells which are to be found in the spleen and bone-marrow. In leukæmia, samples of blood may contain some form of mature or immature leucocyte in a predominating proportion and examination of these has enabled me to obtain information regarding the presence of the agent in leucocytes. In these experiments leucocytes were separated by differential centrifugalisation from citrated blood obtained under sterile conditions. After washing in saline 0·35 c.cm. of the leucocytic cream has been inoculated intracerebrally into rabbits.

The results of these experiments are summarised in the Table. It was found that the agent could be demonstrated in the mixtures of mature granular cells and myelocytes obtained from cases of myelocytic leukæmia, but not in suspensions composed chiefly of myeloblasts. The one case of eosinophilia examined gave a strongly positive result. Weak positive results have also been obtained with lymphocytes; this is surprising since suspensions of lymph nodes in lymphatic leukæmia always give a negative biological test (Gordon 1933). On two occasions I have inoculated rabbits with thick suspensions of the lymphocytes from lymph nodes in this disease, with negative results. The suspensions have been obtained by mincing and grinding up the glands finely with a minimum amount of saline. The suspension was filtered through muslin and centrifuged. The deposit was inoculated after heating to 60° C. to kill any possible contaminating organisms. The latter procedure, which is known not to destroy the agent (Gordon 1934, Friedemann 1934), has been used as a routine when dealing with post-mortem and possibly contaminated material.

The finding in the bronchi of an asthmatic patient at autopsy of thick mucoid material full of eosinophils, has enabled me to test an almost pure suspension of this type of leucocyte. The rabbit inoculated with a suspension of the material in saline developed the typical paralytic condition, commencing on the second day after inoculation.

The presence of the agent has also been confirmed in pure suspensions of neutrophil leucocytes. For this purpose two samples of pus have been diluted and sterilised by heating to 60° C. for an hour. The first was from a streptococcal abscess and it proved to be active for a rabbit in a 1 in 4 dilution. The second, from a staphylococcal abscess, was active in a 1 in 2 dilution.

As the experimental evidence suggests that the agent is particularly associated with mature neutrophil and eosinophil granular leucocytes, it would be expected that it would be found in lymph nodes in which there has been infiltration by these cells. Biological tests have therefore been done on suspensions made from the lymph nodes of a case of chronic myelocytic leukæmia, removed at autopsy, and from one of myelosclerosis. In the latter there was myeloid metaplasia in the abdominal glands. Both these tests were positive. Paterni and Maroncelli (1935) have previously obtained a positive biological test in a case of chronic myelocytic leukæmia.

FINDING OF THE AGENT IN ANIMAL TISSUES

It has been believed that encephalitogenic power was a property only of certain tissues of man and

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monkeys. The bone-marrow of many other animals has been tested and in every case has given negative results (Friedemann 1934, Gordon 1934, Kelser and King 1936). It appears, however, that the tissues of rats and mice and of chickens have not been examined, although these are the animals commonly used for experimental research into blood diseases. I have found that the intracerebral inoculation of suspensions of chicken marrow and spleen has in every case caused a paralysis that appears identical with that produced by human material. The encephalitogenic agent has similarly been demonstrated in mice by using suspensions in saline made from the spleens of several animals. Repeated experiments were carried out with the spleens of rats, but no encephalitic action was obtained. Tests of guinea-pig and rabbit marrow were also negative.

The next step was to test both human and chicken marrow for encephalitogenic power on chickens. Three chickens were inoculated intracerebrally with splenic suspensions resembled those of normal mice and produced paralysis.

HISTOLOGICAL CHANGES PRODUCED BY THE AGENT

During the course of the experiments described above and of others carried out in order to investigate the nature of the agent, a large number of animal brains have become available for histological study. The material has consisted of the brains of rabbits and guinea-pigs and of a few chickens. The majority have been obtained from animals exhibiting, during life, the paralysis typically produced by the agent. The remainder came from unaffected animals or those who only showed atypical signs; these were used as controls. As a routine the brains have been fixed in formalin and longitudinal sections cut through the brain; these have been stained with hæmatoxylin and eosin and with toluidine-blue for the demonstration of Nissl granules. The source of the agent responsible for the paralysis of the animals has

SUMMARY OF RESULTS WITH LEUCOCYTIC SUSPENSIONS

Disease.		Neutrophils %.	Eosinophils %.	Basophils %.	Myelocytes %.	Myeloblasts %.	Lymphocytes %.	Monocytes %.	*Biological test.*
Normal ..	A, B, C	Pooled samples of blood from several patients.							Negative. " Strongly positive.
Chronic myelocytic leukæmia.	A	51	1	9	34	2	3	..	Doubtful weak positive.
	B	25	5	..	65	3	2	..	Positive.
	C	44	2	..	42	8	4	..	"
Acute myelocytic leukæmia.	A	3	..	..	2	87	7	1	Two rabbits negative.
	B	..	..	..	..	Nearly 100	..	..	Two samples tested. Both negative.
Acute lymphatic leukæmia ..		1	..	..	..	..	99*	..	Positive.
Chronic lymphatic leukæmia.	A	2	..	..	..	..	98	..	Weak positive. Signs increased by a 2nd inoculation with lymphocytes.
	B	1	..	..	..	..	99	..	Negative, but signs increased in previously mentioned animal.
	C	10	..	..	..	..	90	..	Negative.
	D	1	..	..	..	..	99	..	1st rabbit: doubtful weak positive. 2nd: negative. 3rd: weak positive.
Eosinophilia ..		5	85	..	..	..	10	..	Strongly positive.

* 72 per cent. lymphoblasts.

human marrow. They all developed signs resembling those produced in rabbits by the agent. Spastic paralysis, ataxia, neck rigidity, spasms, and salivation were noted. On the other hand, two chickens inoculated similarly with chicken marrow were unaffected. This contrast in effect is probably due to an essential difference between the human and chicken agents; it did not appear to be due to any ability of the chicken's brain to neutralise the agent in chicken marrow. An active suspension of the latter, after incubation with an emulsion of chicken brain at 37° C. for eighteen hours, showed no reduction in encephalitogenic power, when compared with suspensions that had been incubated similarly with an emulsion of rabbit brain and with saline.

It has also been possible to examine the tissues of mice affected by a transmissible form of myelomatosis. The mice had been inoculated subcutaneously with tumour cells obtained from an already affected animal; local infiltrating tumours developed associated occasionally with myeloid leukæmic changes in the blood. Kaalenud-Jørgensen (1936) regards the cells of the tumour as myeloblasts and the condition as a transmissible mouse myeloid leukæmia. Thick suspensions of tumour cells have failed to affect rabbits after intracerebral inoculation; varied; brains of rabbits inoculated with lymphadenomatous gland suspensions, human and chicken marrow, and human leucocytes have been examined. In the case of guinea-pigs the source of the agent has been both suspensions of lymphadenomatous glands and of human marrow. Inoculation with human marrow produced the paralysis in the chickens examined.

Examination of this material has shown that there is quite a well-marked variation in the microscopical appearances of the brains, but that these differences are in no way related to the origin of the agent. A suspension of lymphadenomatous glands has, for instance, the same histological effect as human marrow or leucocytes. The one constant and conspicuous change is degeneration of the Purkinjé cells; it has been found in all the brains of affected guinea-pigs and chickens as well as in all the rabbits. The earliest change appears to be a swelling of the cytoplasm with disappearance of the Nissl granules, the nucleus remaining unchanged. Later the appearances indicate death of the cell; the nucleus is found to be pyknotic or the nuclear chromatin broken up into darkly staining masses with disappearance of the nuclear membrane. The whole cell is shrunken and distorted and the cytoplasm shows a homogeneous dark purple colour. The damaged cells finally disappear leaving spaces, which are clearly

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recognisable in material obtained from animals dying soon after inoculation. When the animal is killed later only the marked diminution of Purkinjé cells is apparent. No increase in microglia has been observed around the degenerating cells. These changes are patchy and groups of normal cells or those only moderately affected are usually found. This characteristic degeneration of the Purkinjé cells has been absent from the brains of all animals not showing the typical paralysis.

A similar cellular degeneration and destruction has been found in the cornu ammonis of two rabbits' brains and cells showing the typical degeneration have frequently been found in the mid-brain. A widespread Nissl degeneration of nerve-cells is usually present, but this change is variable in degree. The cerebral cortex is not much affected. Many cells appear dark and shrunken, but similar cells are as frequently seen in the control material. In some of the brains there was no obvious increase in the microglia, but in others these cells were present in large numbers. Collections of mononuclear cells round the vessels were observed in a few sections; although these were greatest near the site of inoculation, they were occasionally present as far away as the cerebellum. In addition, there is constantly a lymphocytic meningitis. If the inoculum has consisted of a cellular suspension, it may often be found collected in the ventricles or on the surface of the brain, and there is well-marked proliferation of the capillaries in the neighbourhood. The whole brain usually appeared œdematous and the capillaries increased in number and dilated.

The occipital cortex of the guinea-pigs was examined carefully for evidence of any cell damage to account for the blindness noted in these animals. None was found and the retinæ of the eyes also appeared normal on section. The brains of the chickens inoculated with human marrow showed the characteristic changes in the cerebellum; it was less marked than in the rabbit material, but was associated with a marked Nissl degeneration of the rest of the nerve-cells. Sections of the brain of one rabbit were stained by the Weigert-Pal technique; this did not demonstrate any demyelination. The long Mann method was used for staining brains of other rabbits and a search was made for inclusion bodies, but without success.

Kelser and King (1936) described similar histological changes in the material they examined; they used human and monkey marrow as the source of the agent. Their findings have thus been confirmed and extended to include other sources of the agent.

DISCUSSION

These experiments show that the encephalitogenic agent is present in neutrophil and eosinophil leucocytes and in the mixtures of these with myelocytes. It appears also to be present to some extent in the circulating lymphocytes, but the encephalitogenic action of normal leucocytic suspensions and of marrow is probably due to their content of mature granular leucocytes. The agent has not been found in such primitive cells as myeloblasts.

It has already been stated that no histological differences have been found depending on the various sources of the agent. Likewise the condition of the affected animals during life is the same. The agent in lymphadenomatous glands therefore has the same effect as that in leucocytes and there is no reason to think they are not identical. It is likely that the activity of a gland suspension depends on its cell content. In such diseases as myelocytic leukæmia and myelosclerosis, in which there is infiltration of the lymph nodes with myeloid cells, these nodes give a positive test. In lymphadenoma granular cells are usually found in the lymph nodes, the eosinophils being the most conspicuous. Turner, Jackson, and Parker (1938) consider that the eosinophil leucocytes alone contain the agent. But the experiments described in this paper suggest that the neutrophil leucocyte is equally active, and that the lymphocyte of the blood is slightly active. Van Rooyen (1937) has found that the activity of a lymphadenomatous gland is not proportional to its eosinophil content; he considers, however, that it may be dependent on the number of reticulum cells. If, then, it is true that the biological test in lymphadenoma depends on the cell content of the lymph nodes, its limitations are obvious when used as a diagnostic measure in a case of lymphadenopathy.

When a biological test is carried out, the specificity of the degeneration found histologically makes it possible to confirm the result of the test. This histological examination also affords a more delicate method of detecting the agent. When a series of dilutions of an active suspension has been inoculated into guinea-pigs, the high dilutions have produced degeneration of the Purkinje cells, although during life the animals did not appear to be affected. Parallel experiments have also shown that guinea-pigs are more sensitive than rabbits. In the guinea-pigs an early sign is defect of vision and this may be present in the absence of paralysis or ataxia.

SUMMARY

1. An encephalitogenic agent has been demonstrated in suspensions of eosinophil and neutrophil leucocytes, mixture of these with myelocytes, and in the circulating lymphocytes. It was absent from myeloblasts. It was present in lymph nodes in which there had been infiltration with myeloid cells.

2. A similar agent has been found in chicken and mouse spleen, but not in that of rats. It was absent in a mouse tumour composed of myeloblasts.

3. Distinctive histological changes result from the intracerebral inoculation of the agent into animals. These are described.

I wish to thank Dr. M. H. Gordon and Prof. J. McIntosh for the valuable help they have given me; the former has, in addition, kindly placed material at my disposal, and the latter has allowed me to carry out the greater part of these experiments in the research laboratories at the Bland-Sutton Institute of Pathology, Middlesex Hospital. I have been enabled to carry out this work with the aid of the Lawrence research scholarship at St. Bartholomew's Hospital.

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LONDON SCHOOL OF DERMATOLOGY.—A course of lectures will be given at St. John's Hospital for Diseases of the Skin, Lisle-street, W.C., from May 2nd to May 27th, at 5 P.M. Instruction will also be given daily in the out-patient department at 2 P.M. and 6 P.M. on weekdays and at 10 A.M. on Saturdays. Further information may be had from the dean of the school, Lisle-street, London, W.C.2.

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THE EFFECT OF NICOTINIC ACID ON PELLAGRINS MAINTAINED ON A PELLAGRA-PRODUCING DIET*

BY JEAN M. GRANT
ELISABETH ZSCHIESCHE
AND
TOM D. SPIES, M.D. Harvard

Spies, Cooper, and Blankenhorn (1937) reported that the mucous membrane lesions of pellagra heal promptly on the administration of nicotinic acid, and from these results concluded that nicotinic acid is an antipellagric factor. Fouts, Helmer, Lepkovsky, and Jukes (1937) have described improvement in the mucous membrane lesions of pellagrins who were given nicotinic acid in addition to a pellagra-producing diet (the diet was the same as that used by Spies, Cooper, and Blankenhorn in their studies). Smith, Ruffin, and Smith (1937) described improvement in a case taking a similar pellagra-producing diet within twelve days of the administration of nicotinic acid. Spies, Cooper, and Blankenhorn (1938) more recently have confirmed their previous observations in a series of twelve cases, and in addition have shown that the mucous membrane lesions of pellagra heal on the administration of nicotinic acid whether or not the patient receives food. The present report is concerned with an evaluation of the effect of nicotinic acid when used as a supplement to a pellagra-producing diet.

MATERIAL AND METHODS

Seven persons with characteristic pellagrous lesions were selected for study. All of them had extensive mucous membrane lesions, six exhibited characteristic dermal changes, four had mental symptoms, and four had peripheral neuritis. Spies has previously shown (1932, 1934, 1935) that a substance can be tested for the presence of an antipellagric factor by administering it to pellagrins subsisting on a pellagra-producing diet. Briefly, this method consists in selecting severely ill pellagrins with classical mucous membrane lesions, isolating them, and restricting them to a pellagra-producing diet. The diet used is shown in the accompanying Table. If no healing of the mucous membrane lesions occurs after the patient has remained on the diet for two or three days, the substance to be tested is administered. If, after the administration of the substance, the mucous membrane lesions promptly disappear and the patient's sense of well-being improves, one can conclude that the substance is potent and that it has been given in adequate amounts.

The present studies were carried out in the following manner: All patients were restricted to the basic pellagra-producing diet. If, after 48–72 hours there was no improvement in the oral mucous membrane lesions, the patients were given daily supplements of nicotinic acid until improvement took place. These supplements varied in amount and totalled from 200 to 1500 mg. per day. The nicotinic acid was usually given in divided doses of 100–200 mg. each. After nicotinic acid had produced healing of the mucous membrane lesions in all cases, this supplement was discontinued in two of the cases, while the remaining five continued to take daily supplements of this substance. The seven patients went on taking the basic diet for 1–2 months from the time the test began, irrespective of whether or not the supplements of nicotinic acid were continued. At the end of the study they were all given well-balanced diets and were discharged to their homes greatly improved. The urine of the seven pellagrins was repeatedly tested for porphyrinuria by the method of Beckh, Ellinger, and Spies (1937). Special studies of some of the patients with peripheral neuritis were made. Summaries of the two cases in which nicotinic acid was discontinued while the patient remained on a restricted diet follow.

CASE 1.—This patient, a negro female, aged 16, had classical symptoms of pellagra. Her diet had been deficient for a number of years. She had not indulged in alcoholic beverages and had no predisposing disease. When first seen, the mucous membrane lesions of her mouth, tongue, and vagina were fiery red. Many large, aphthous ulcers and thick membranes from Vincent's organisms were observed. She also had pellagrous dermatitis and increased porphyrinuria. She was given a pellagra-producing diet at the time of admission. During the next two days the mucous membrane lesions became worse. She was then given 100 mg. of nicotinic acid each hour for five hours. Twelve hours later she was given an additional 500 mg. in a similar manner. Within forty-eight hours the mucous membrane lesions had healed and the increased porphyrinuria had disappeared. The dermatitis began to heal soon after the patient entered the hospital and continued to heal throughout the course of the study. Desquamation was almost complete at the end of the first two weeks. The nicotinic acid was discontinued and the patient remained on the pellagra-producing diet. Within fourteen days there was a mild recurrence of the mucous membrane lesions and increased porphyrinuria but no return of the dermatitis. Again the administration of nicotinic acid was followed promptly by healing of all mucous membrane lesions and disappearance of the porphyrinuria. As soon as the mucous membrane lesions had healed she was given a 4500-calorie, well-balanced diet, and two weeks later was discharged from the hospital free from symptoms.

CASE 2.—This patient likewise had developed characteristic pellagra, severe Vincent's infection, and increased porphyrinuria following the ingestion of an inadequate diet. Upon admission to the hospital she was put on a pellagra-producing diet and the mucous membrane lesions became worse. Two days later she was given five doses, 200 mg. each, of nicotinic acid. The mucous membrane lesions and increased porphyrinuria disappeared within forty-eight hours of the initial administration of nicotinic acid. The patient remained on a pellagra-producing diet and was allowed physical exercise, but was not given nicotinic acid. Within ten days the mucous membrane lesions and increased porphyrinuria recurred. They increased in severity and five days later nicotinic acid was administered as before. Again the lesions and increased porphyrinuria disappeared without any change being made in the diet. Once more the nicotinic acid was discontinued. Three weeks later the lesions and increased porphyrinuria recurred, and again on the administration of nicotinic acid they disappeared promptly. The skin lesions, as in Case 1, began to heal soon after the patient entered the hospital and continued to heal throughout the course of the study. Despite the fact that the patient was free from any symptoms she was given a 4500-calorie, well-balanced diet for ten days before discharge from the hospital.

OBSERVATIONS

The mucous membrane lesions of the seven patients taking a pellagra-producing diet improved within

* These studies were conducted in the medical wards of the Cincinnati General Hospital and the expenses were defrayed by a grant from the Rockefeller Foundation.

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forty-eight hours of the administration of nicotinic acid. This improvement could usually be detected within twenty-four hours, and oftentimes within twelve hours. The ptyalism, Vincent's infection, and increased porphyrinuria likewise disappeared. The peripheral neuritis did not improve during the time nicotinic acid was given to these patients; this will be discussed in a subsequent publication. The appetite of five patients improved, and all of them lost their sense of apprehension and had an improved sense of well-being.

These observations show that nicotinic acid is an important supplement to the pellagra-producing diet. The prompt improvement of the mucous membrane lesions under the conditions of this study indicates that nicotinic acid should be considered a specific antipellagric factor. In addition to being specific for these symptoms of pellagra, this substance promotes a sense of strength and a feeling of well-being in the majority of patients taking the pellagra-producing diet. The observation that the increased porphyrinuria of pellagrins restricted to a pellagra-

BASAL DIET

Food.	Weight (g.).	Protein (g.).	Fat (g.).	Carbohydrate (g.).	Minerals (g.).								Vitamins A, B_1, C, D = international units. Vitamin G = Sherman-Bourquin units.				
					Ca.	Mg.	K.	Na.	P.	Cl.	S.	Fe.	A	B_1	C	D	G
BREAKFAST.																	
Homing grits ..	35	3·3	0·1	27·5	0·004	0·020	0·061	0·007	0·051	0·016	0·048	0·0003	..	..	..	..	Trace
Cornmeal muffins* (3 muffins) ..	..	9·9	11·1	91·2	0·019	0·048	0·161	0·051	0·138	0·108	0·148	0·0009	192–321	24	..	..	15
Sugar	15	..	..	15·0	..	..	..	..	..	..	..	..	..	..	..	..	..
Coffee	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
DINNER.																	
Fried cornmeal mush :†																	
Cornmeal, dry weight ..	20	1·6	0·2	15·9	0·004	0·017	0·043	0·008	0·038	0·029	0·022	0·0002	84–140	5	..	..	6
Pork fat ..	40	..	40·0	..	..	..	..	..	..	..	..	..	3	22	..	..	..
Cane-sugar syrup :‡																	
Sugar	14	..	..	14·0	..	..	..	..	..	..	..	..	..	..	..	..	..
Water	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Sweet potato ..	163	2·9	1·4	44·6	0·031	0·046	0·647	0·063	0·073	0·153	0·039	0·0012	11,410	24	240–360	..	57
Cabbage, raw shredded ..	16	0·2	..	0·8	0·007	0·002	0·039	0·004	0·005	0·007	0·010	0·0001	..	3	88–132	..	6
Cornmeal muffins (3 muffins) ..	..	9·9	11·1	91·2	0·019	0·048	0·161	0·051	0·138	0·108	0·148	0·0009	192–321	24	..	..	15
Sugar	10	..	..	10·0	..	..	..	..	..	..	..	..	..	..	..	..	..
Coffee	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
SUPPER.																	
Fried cornmeal mush :																	
Cornmeal, dry weight ..	20	1·6	0·2	15·9	0·004	0·017	0·043	0·008	0·038	0·029	0·022	0·0002	84–140	5	..	..	6
Pork fat ..	40	..	40·0	..	..	..	..	..	..	..	..	..	3	22	..	..	..
Cane-sugar syrup :																	
Sugar	14	..	..	14·0	..	..	..	..	..	..	..	..	..	..	..	..	..
Water	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Spinach	60	1·2	0·1	1·9	0·040	0·022	0·046	0·075	0·041	0·044	0·023	0·0015	21,000	7	480–720	..	75
Cornmeal muffins (3 muffins) ..	..	9·9	11·1	91·2	0·019	0·048	0·161	0·051	0·138	0·108	0·148	0·0009	192–321	24	..	..	15
Sugar	15	..	..	15·0	..	..	..	..	..	..	..	..	..	..	..	..	..
Coffee	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	..	40·5	115·3	448·2	0·147	0·268	1·362	0·318	0·660	0·602	0·608	0·0062	33,160–33,659	160	808–1212	..	195

Calories from protein	162·0
" " fat	1037·7
" " carbohydrate	1792·8
Total calories	2992·5

Note.—Protein, fat, carbohydrate, and mineral values—Sherman, H. C.: Chemistry of Food and Nutrition.
Vitamin values—Sherman, H. C.: Chemistry of Food and Nutrition.
Cowgill, G. R.: The Vitamin B Requirement of Man.
Vitamin Content of Foods, U.S. Dept. of Agriculture, Miscellaneous Publication, No. 275.

* RECIPE FOR CORNMEAL MUFFINS

Materials.	Weight (g.).	Protein (g.).	Fat (g.).	Carbohydrate (g.).	Minerals (g.).								Vitamins A, B_1, C, D = international units. Vitamin G = Sherman-Bourquin units.				
					Ca.	Mg.	K.	Na.	P.	Cl.	S.	Fe.	A	B_1	C	D	G
Cornmeal ..	138	11·4	1·7	109·7	0·0248	0·1159	0·2939	0·0538	0·2622	0·2014	0·1531	0·0012	579–966	34	..	..	45
White flour ..	165	18·8	1·6	123·9	0·0330	0·0297	0·1907	0·0990	0·1518	0·1221	0·2920	0·0016	..	25	..	..	..
Pork fat	30	..	30·0	..	..	..	..	..	..	..	..	..	2	16	..	..	..
Sugar	40	..	..	40·0	..	..	..	..	..	..	..	..	..	..	..	..	..
Baking powder ..	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Salt	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Total—9 muffins ..	..	30·2	33·3	273·6	0·0578	0·1456	0·4846	0·1528	0·4140	0·3235	0·4451	0·0028	581–968	75	..	..	45
1 muffin ..	..	3·3	3·7	30·4	0·0064	0·0161	0·0538	0·0169	0·0460	0·0359	0·0494	0·0003	64–107	8	..	..	5

† Cornmeal mush: Cornmeal weighed dry, cooked in boiling salted water, allowed to cool, sliced, fried in pork fat, and served with cane sugar.
‡ Cane-sugar syrup: Sugar weighed, water added, cooked to make syrup.

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producing diet were cured in every instance by administration of nicotinic acid and did not recur so long as it continued does not mean that other essential factors are not missing in the basic diet.

SUMMARY AND CONCLUSIONS

1. The prompt improvement in the mucous membrane lesions of severe pellagrins, restricted to a pellagra-producing diet, following the administration of nicotinic acid indicates that nicotinic acid is an antipellagric factor.

2. The fact that the lesions did not recur in the five pellagrins continuing to take nicotinic acid and a basic pellagra-producing diet, and yet did recur in the two pellagrins on a similar diet when the supplement of nicotinic acid was discontinued, likewise suggests that nicotinic acid is an important antipellagric factor.

3. The importance of nicotinic acid as a potent therapeutic substance is indicated not only by the fact that certain specific symptoms of pellagra disappear promptly following its administration, but also by the fact that the patient receiving nicotinic acid rapidly regains strength and has an increased sense of well-being.

4. While these observations show that nicotinic acid induces healing of certain pellagrous lesions while the person continues to take the pellagra-producing diet, it is not in any sense recommended that pellagrins be treated by means of a pellagra-producing diet plus nicotinic acid. It seems to us that pellagra-producing diets are deficient in a number of chemical substances.

5. The disappearance of the increased coproporphyrinuria following the administration of nicotinic acid seems of importance in the pathogenesis of the disease.

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BIOLOGICAL POLYVALENCY OF ANTIGENS

WITH SPECIAL REFERENCE TO HAY-FEVER

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EVIDENCE for the antigenic homogeneity of the English grass-pollens was last summarised by one of us (Freeman 1933) when again it was shown that the pollens of all the grasses under examination were antigenically of the same type—i.e., if a patient reacts to any one of the grass-pollens he reacts to them all. Further, if the patient is successfully desensitised with, and to, any one pollen, he also ceased to react to any of the others. No evidence has since appeared to throw doubt on these results, though it is clearly impossible to make specific tests on every one of the five or six hundred varieties of English grass, and it seems fair to deduce that so far as practical diagnosis and desensitisation are concerned, all grass-pollens may be taken as the same.

But there is another method of reinforcing this conclusion. This is to select a few of the graminæ which, though they are biologically speaking of the grass family, are yet as far removed as possible from our English Timothies, cocksfoots, Yorkshire mists, &c. We wanted them far removed not only in place of origin and in general botanical characteristics but also in the respect that they are not to any considerable extent cultivated in this country. For this purpose Indian corn (maize), bamboo, and sugar-cane were selected; taking them by and large it may be said that their pollens fall into line with the indigenous English grasses from the antigenic point of view.

THE MATERIAL

Maize.—Tests continued now for several years have shown that maize-pollen behaves antigenically in the same way as the pollen of the English grasses, though the extract from it is not so strong for a given weight of pollen, possibly because maize-pollen grains are themselves much heavier than for example those of Timothy grass.

Bamboo.—Pollen goes mouldy very quickly if at all damp, but after many years of failure a very small quantity of good bamboo-pollen was obtained from Ceylon. All the results of the prick tests made with this, both positive and negative, tallied exactly with results from English grass-pollens; not only were known hay-fever cases tested with positive results, but non-hay-fever control cases were also tested. A few of these "negatives" were normals—i.e., non-allergics—but for the most part they were selected from an asthma clinic; two of these unexpectedly gave a reaction to bamboo, but on testing with Timothy pollen also these two were found to be true, but as yet unsuspected, hay-fever cases. On other occasions three cases sent to the hay-fever clinic with notes from their practitioners declaring them to be "undoubted cases of severe hay-fever" failed to give the bamboo test, but failed also to react to Timothy grass.

Sugar-cane.—Large quantities of the Jamaican sugar-cane were very kindly collected for us by Mr. H. L. Sampson of Kew, from the wild as well as from the cultivated varieties; however, as we found that *Sacchanum officialis* and *spontaneum* gave in all their skin reactions identical results, there is no need to differentiate them here. We may say at once that sugar-cane pollen shows a very close similarity to pollens of all the graminæ we have tested—far closer for example than to the pollens of the garden flowers, but as it does show some slight differences our results should be given in full. The cane-pollen—which had been extracted and standardised in our usual way—was used together with Timothy pollen for routine diagnostic prick tests, and the resulting weals were traced off on to prepared slides after 15 min.

THE EXPERIMENTS

For convenience women and children only were used for these experiments as we wanted to test as many as possible several times during the course of treatment. The cases were in all respects unselected save that they were reputed to be hay-fever. In no instance did we get a positive cane reaction among the non-hay-fevers—i.e., among those who did not react to English grass-pollen. These are therefore not referred to again. None of the people giving a positive sugar-cane reaction had ever lived in a sugar-cane country. The results are summarised in Table I.

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It will be seen that in the majority of the cases there is no detectable difference between the cane and Timothy pollens, and in those cases where there appears to be some difference, most are within the limits of experimental error. Not all the differences however can be explained in this way, since in three cases there was no reaction to cane in the presence of a sharp reaction to Timothy. These were all retested on several occasions and with greater concentrations of the pollen extract, but persisted in being negative or negligible to cane, while Timothy pollen gave the normal positive reaction.

TABLE I—COMPARISON OF SKIN REACTIONS TO SUGAR-CANE AND TIMOTHY-GRASS POLLENS

Total cases examined	123
Timothy equal to cane	86
„ rather less than cane	12
„ „ more „ „	22
„ positive, cane negative	3
„ negative, „ positive	0

TABLE IIA

Cases having several series of tests	68
Decrease equal for Timothy and cane	47
Lag in decrease to cane	21

Table IIA analyses those patients that appeared for skin tests often enough for the progress of their treatment to be followed more fully. The term "lag" is used to indicate that in these patients the reaction to cane did diminish, but rather more slowly than the reaction to Timothy; there was a slight delayed response which suggests some antigenic difference.

TABLE IIB

Total cases showing complete loss of reaction on treatment with Timothy	15
Complete loss to both Timothy and cane	6
Some sensitivity to cane alone	9

It will be seen in Tables II A and II B that it was only in the minority of cases that the reactions do not tally very completely, though the majority behave in exactly the same way to both.

For comparison most of the patients were tested with three other pollens, daffodil, heather, and michaelmas-daisy. These were chosen because they are fairly well-separated families, and because the two latter pollens do account for a certain number of cases of seasonal rhinorrhœa often described as "hay-fever." These "garden-flower" pollens are, in contrast to grass-pollen, clearly different antigenically from the whole group of graminæ.

TABLE III—REACTIONS TO GARDEN-FLOWER POLLENS IN HAY-FEVER SUBJECTS

Total tests recorded		48
Dermographic		9
Positive to one pollen		8
(a) Michaelmas-daisy	6	
(b) Heather	2	
Positive to two pollens		11
(a) Michaelmas-daisy and heather	9	
(b) Michaelmas-daisy and daffodil	2	
Positive to all three pollens		1
Total positive		20
Total negative, at least		28*

* Probably about 75.

Unfortunately all the negative results were not recorded, though all the positive reactions were traced; the proportion of positive reactions given in the Table is therefore too high. The term dermographic has been used to describe those cases where the normal saline and the three pollens react equally, and are regarded as negative. In nearly all the positive reactions the weal was not so large as those given by the Timothy and the cane, but in two cases they were about equal in size, and were associated with histories of clinical "hay-fever" in the autumn. Both were to michaelmas-daisy.

There is a further interest in this biological spread of antigenic properties apart from the treatment of hay-fever. Much evidence has accumulated during the last 20 years that the compositæ share many antigenic characteristics. This is of the greatest importance in the U.S.A. where their Fall "hay-fever" from compositæ even outweighs in intensity their true hay-fever from grasses of midsummer; to a less extent it is of course important here in England where the trouble from michaelmas-daisy pollen in September and October is second only to our June hay-fever, as was shown by one of us several years ago.

It will be recollected that in 1920 it was demonstrated (Freeman) that horse-asthmatics are sensitive also to all the equidæ—i.e., to donkeys, zebras, kiangs, and onegas. Similarly there is abundant clinical evidence, gleaned from Regent's Park Zoo, that patients sensitive to cats are sensitive also to the felidæ in general—great and small. Similarly not only do all the different dogs go together as one might expect, but foxes and wolves go with them. The weasel tribe has a common antigen as shown by fur-eczema and fur-asthma. We have noticed moreover that people sensitive to vegetable marrows are sensitive to cucumbers and melons, and presumably to the rest of the gourd family. The mioplasms of all the fishes run together so far as we have tested them. It seems to us therefore that in place of making mixtures of pathophanes in order to carry out group tests—a practice which has serious disadvantages—more close attention should be paid to biological relationships.

Those who wish to cling to the hypothesis that a sensitisation process by the peccant antigen always takes place (thus falling into line with anaphylaxis) are at liberty to explain some of their difficulties by supposing that when a person is found to be sensitive to a protein with which he has never yet come into contact he has become sensitive by contact with a close biological relative. Thus he may become sensitive to bamboo-pollen by contact with the English Timothy, and to the zebra by perhaps the horse-manure in his English garden. It is interesting that whereas hen's eggs and pheasant's eggs, which are closely related biologically, are antigenically identical, hen's eggs and duck's eggs do not necessarily give the same reactions—though they usually do.

By the end of the season these results appeared sufficiently definite to justify our desensitising a case of hay-fever with cane-pollen. The desensitisation reduced the skin reaction to both pollens equally, and the treatment was clinically successful.

CONCLUSIONS

1. Foreign grasses not grown to any extent in this country give positive skin reactions in people with hay-fever who have not previously been exposed to them.

2. Maize- and bamboo-pollens could not be distinguished antigenically from the English grass-pollens.

3. Sugar-cane pollen behaves in the same way as English grass-pollen in the majority of cases.

4. There is a slight antigenic difference between cane-sugar pollen and the others, indicated by a minority of the cases which were desensitised with

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Timothy losing their reaction to cane more slowly. Also three cases were found which were not sensitive to the cane-pollen, but which were definitely sensitive to Timothy.

5. A comparison between the pollen of the graminæ and pollen of the garden flowers showed that such markedly exotic "grasses" as maize, bamboo, and sugar-cane are far more closely related to the English grasses antigenically than to the English garden flowers.

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DIASTOLISATION IN CATARRHAL CONDITIONS OF NOSE AND MIDDLE EAR IN CHILDREN

By Arthur Miller, F.R.C.S. Edin., D.L.O.

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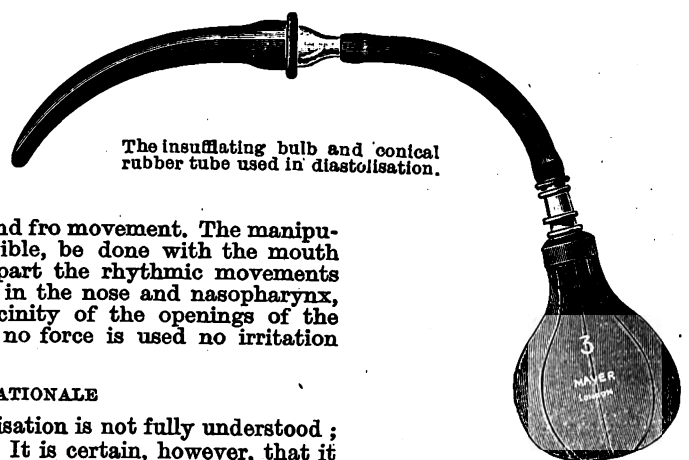
George Gautier first described diastolisation in 1924. It was subsequently introduced into this country in 1926 by Arthur Wells and is now extensively used in L.C.C. clinics. Diastolisation got its name from the similarity of movements produced by systole and diastole.

The following is a brief description of this treatment.

TECHNIQUE

The nasal cavities are first of all cleaned by instructing the patient to blow the nose, one side at a time. Conical hollow rubber tubes (see Figure) open at one end are dipped in liquid paraffin and are gently introduced into the nasal passages until they reach the pharynx. An insufflating bulb is attached to the open end of the tube, and by alternately compressing and releasing the bulb, corresponding movements are imparted to the bougie, the whole tube being at the same time given a to and fro movement. The manipulation should, if possible, be done with the mouth closed in order to impart the rhythmic movements of the bulb to the air in the nose and nasopharynx, particularly in the vicinity of the openings of the Eustachian tubes. If no force is used no irritation follows this procedure.



The insufflating bulb and conical rubber tube used in diastolisation.

RATIONALE

The action of diastolisation is not fully understood; one can only surmise. It is certain, however, that it is not merely mechanical; nor does the treatment aim at merely distending the nasal passages. The distension produced is more due to retraction of the mucous membrane and underlying soft tissues as the result of the stimulation caused by its contact with the bougie, than to pressure. The sympathetic and other nerve-endings in the nasal mucosa and its connexions with the sphenopalatine ganglion regulate the vasomotor and secretory function of the mucous membrane lining the nose, sinuses, and probably middle-ear cleft. There is also a reflex connexion between the nose on one side and bronchial tubes and diaphragm on the other, via the first and second branches of the Vth nerve to the motor roots of the vagus. It is thought that the stimulation of these nerve-endings in the nose by diastolisation encourages glandular activity of the mucosa and tends to re-establish the normal flow of lymph. It is also believed that the respiratory system and diaphragm are stimulated at the same time by reflex action.

In persistent mouth-breathing the nasal mucosa has become inert and less sensitive to the stimulating effect of the air striking it. This would explain why, sometimes, after a successful adenoidectomy, when a clear airway has been established, nasal breathing is not, or is only partially, restored. This fact has long been recognised by a number of rhinologists who make a practice of ordering breathing exercises after every tonsil and adenoids operation. Again, if the air cannot enter the nose and its stimulating effect on the mucosa is lost, the reflex stimulation of the lungs and diaphragm will also be impaired. For this reason, when a child keeps his mouth open the excursions of the diaphragm are poor, air entry in the lungs is deficient, massage of the liver and intestines which follows the movement of the diaphragm is slight, and nutrition is impaired. This has been proved by Pech (1921) with the "masque manometrique" that he invented, which registers the respiratory flow in metres per second. Readings were taken before nasal treatment was begun and again when nasal respiration had been re-established. Pech and Genevois were able to show with this instrument that the respiratory flow was increased after nasal respiration had been restored by diastolisation. The thoracic indices (the measurement of the excursion of the diaphragm) as seen by X ray examination improved, in some cases, twofold after this treatment.

INDICATIONS

The principal aims of diastolisation are first to restore nasal respiration in cases of hypertrophic rhinitis, and secondly to treat conditions very often due to nasal insufficiency, such as mouth-breathing, Eustachian catarrh, catarrhal deafness and sinusitis.

In the *new-born child and infant* diastolisation is particularly indicated as a restorer of nasal breathing where the usual form of surgical treatment is impossible. Nasal obstruction in the infant, if one excludes syphilis, is due either to adenoid tissue or to thickening of the nasal mucosa. The danger of mouth-breathing, with its resulting damage to the middle ear, is a real one in the infant, because the Eustachian tube is short and horizontal and the opening very wide. The nasal catarrh caused by mouth-breathing produces a continual discharge, which is swallowed in the day-time and often finds its way into the trachea at night. A simple superimposed coryza may then give rise to inflammation of the middle ear and to pulmonary and other complications. Wisner (1928) and Worms (1925) have treated a great number of infants suffering from nasal insufficiency by diastolisation, some after an adenoidectomy. All of them showed definite improvement both locally

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and generally, which persisted. My own experience is limited to three infants suffering from chronic suppurative otitis media with mouth-breathing; the discharge was mucoid. Nasal breathing was established after diastolisation and the ears dried up shortly afterwards.

My main experience in diastolisation, however, has been with *school-children*, while treating them in connexion with the audiometer tests. These tests are directed by Mr. Arthur G. Wells, and L.C.C. school-children have been subjected to them on a large scale since 1934. Two consecutive tests are made and those who fail to pass them are referred to the aurist for investigation. There are a variety of causes for this failure, such as chronic—or past—suppurative otitis media, antecedent mastoid operations, or cerumen[1]; but the great majority of cases of defective hearing were found to be due to chronic catarrh of the Eustachian tube and middle ear, with or without indrawn tympanic membrane. In the presence of mouth-breathing, hypertrophic rhinitis, or catarrhal sinusitis, most of the children referred to me for investigation were ordered a course of diastolisation, unless an enlarged or infected pad of adenoids was present, or a badly deflected septum. The course consisted of twelve treatments, administered twice a week; very often two to three courses were required. The result of this treatment on the hearing will be seen from the above figures issued by the L.C.C. These figures show that about 47 per cent. of the children to whom this treatment was given had sufficiently improved to pass the third test, which is that of normal hearing; while about 24 per cent. benefited by it to a lesser degree. The remainder showed no improvement.

—	*1935.*	*1936.*
Total examined	28,038	45,579
Failed first two tests ..	2,201	3,755
Diastolisation: total	184	591
Passed final test	88	269
Improved only	33	155
No improvement	63	167

SUMMARY

No extravagant claims are made for diastolisation. It is useful when treating hypertrophic rhinitis, catarrhal sinusitis, Eustachian and middle-ear catarrh with associated deafness, nasal insufficiency due to persistent mouth-breathing, and non-use of the nose. It stimulates the nerve-endings of the indolent nasal mucosa and re-educates nasal breathing, thus improving pulmonary respiration.

To the usually recognised function of the nose of warming, purifying, and moistening the air must be added that of the stimulating effect produced by the air striking the nerve-endings of the mucosa.

The main object of this article has been to stimulate interest in an important but perhaps somewhat neglected subject, and to induce other rhinologists to use diastolisation—a treatment which I myself took up in the first place with scepticism.

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CLINICAL AND LABORATORY NOTES

A CASE OF PELLAGRA TREATED WITH NICOTINIC ACID

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THE use of nicotinic acid in the treatment of pellagra has recently been described by Spies (1938). He records the rapid disappearance of symptoms in fifteen patients. The following note describes a case similarly treated.

A schoolmaster aged 28 was admitted into University College Hospital on Feb. 3rd, 1938. In 1931 he had complained of indigestion and vomiting which were relieved by diet; symptoms recurred in 1933 when a barium meal showed no abnormality; his appendix was removed. Subsequently he had recurrent attacks of epigastric pain which were often relieved by vomiting; no ulcer was discovered by radiography, but a very strict diet was recommended. Thenceforward he had subsisted for the most part on milk, cereals, and a little egg, fish, bread and butter; according to his mother the quantities eaten had been very meagre and a vicious circle had been established in which any increase in this diet caused pain and vomiting. There was at no time any radiographic evidence of ulcer. His weight gradually diminished.

In the summer of 1937 he drove for ten miles in a car and one hand was exposed to sunlight; this resulted in severe sunburn; the patient from then onwards protected his face and hands from the sun.

In February, 1938, he was admitted for investigation. He was wasted and weighed 8 st. 12 lb., was depressed and apathetic, and had a sore tongue and frequent loose and offensive stools; follicular hyperkeratosis was present on and around the nose and in the nasolabial folds, where plugs stood out from the follicles. The cardiovascular system, urine, lungs, and central nervous system showed no abnormality the abdomen was tympanitic but otherwise normal; a blood count showed mild microcytic anæmia, fractional test-meal hyperchlorhydria, the stools no excess of fat. A barium meal showed no organic lesion of the alimentary tract but considerable flatus and hyperperistalsis. Temperature, pulse, and respiration-rates were normal. Cholecystography was negative.

On Feb. 25th nicotinic acid treatment was begun in doses of 90 mg. daily by mouth, the dose being doubled on March 10th. By Feb. 28th his tongue had become normal, his depression had gone, and his diarrhœa had stopped. The follicular hyperkeratosis was seen to be diminishing daily and by March 23rd, the date of discharge, had nearly disappeared. He was given a liberal diet and tended to get colic from time to time, but stated that his appetite, previously poor, had returned. His weight, which had dropped to 8 st. 9½ lb., did not begin to increase till March 18th.

In this case symptomatic improvement was rapid, but it is interesting to note that for three weeks

[1] It is interesting to record that there were 5 children with congenital absence of the auditory meatus amongst the 4000 children I examined.

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the patient's weight did not respond to treatment on a full diet, whereas in a recent case treated with the filtrate factor from liver (Yudkin, Hawksley, and Drummond 1938) the gain in weight was rapid. The filtrate factor may contain more factors than one; on the other hand the dose of nicotinic acid used in this case was small.

This note may serve as a warning of the effects of dietetic restriction imposed for a set purpose but carried to excess during a number of years by an over-conscientious patient.

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SEVERE HÆMORRHAGE FROM A MECKEL'S DIVERTICULUM

By H. F. Moseley, M.Ch. Oxon., F.R.C.S. Eng.
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A FAT boy aged 8 was brought to St. Thomas's Hospital because of severe melæna of three days' duration. The melæna was preceded by an attack of abdominal pain, with vomiting. There was a history given that two years before he had had similar abdominal pain, lasting three weeks, but no melæna was observed.

On examination the patient was obviously anæmic—hæmoglobin, 44 per cent.; red cells, 2,000,000; colour-index, 0·8; polychromasia was present. The abdomen was tender on palpation around the umbilicus, but nothing more definite was found. Proctoscopy was negative.

In view of a previous case reported last year by Card and Mimpriss the correct diagnosis of a bleeding Meckel's diverticulum was made. Two attempts to visualise the diverticulum by a barium meal examination were unsuccessful. A laparotomy was performed by Mr. B. C. Maybury and a Meckel's diverticulum, 2½ in. long, was found and resected. Fig. 1 shows the ulcer at the junction of the mucosæ between the diverticulum and ileum. This had perforated the whole wall, and the omentum had closed the base of the ulcer externally, preventing the peritonitis that had occurred in the case previously reported. Fig. 2 shows that the mucosa of the diverticulum is as found in the stomach, with oxyntic cells. This passes into the ileum through an area which has the appearance of duodenal mucosa.

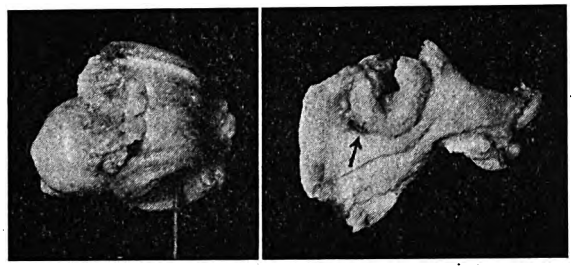

FIG. 1.—The diverticulum. Left: external view showing piece of omentum overlying the site of the ulcer. Right: the ileum opened longitudinally, the arrow showing the ulcer.

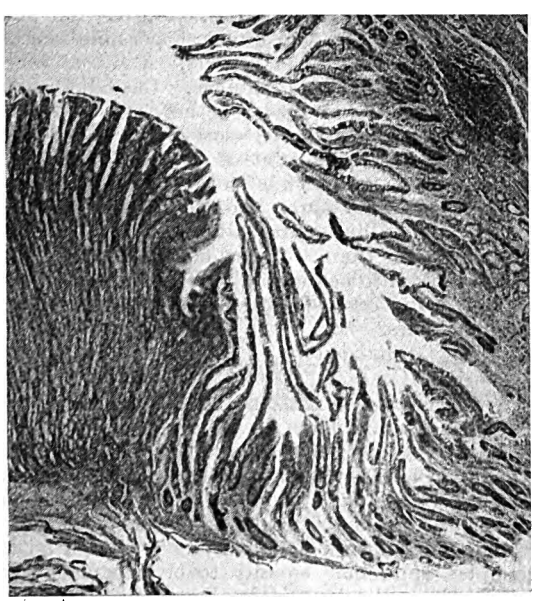

FIG. 2.—Photomicrograph showing change in type of mucosa between the diverticulum (on left) and the ileum.

The patient made an uninterrupted recovery and was perfectly free of abdominal pain and melæna when last seen.

I wish to thank Mr. Maybury for permission to publish this case.

Reference.—Card, W. I., and Mimpriss, T. W. (1937) *Lancet*, 2, 963.

THE LANCET 100 YEARS AGO

April 21st, 1838, *p.* 122.

From a leading article on the improved health of the navy.

Before the reign of HENRY VIII. and ELIZABETH, when the first large vessels were built, we read little of scurvy and ship fevers. Ventilation was inevitable in small open ships. Before those periods, too, long voyages were rarely attempted, and our navies were never stationed on the destructive coasts of Africa, or the West India Islands. In the Crusades (1250), scurvy ravaged the fleet of ST. LOUIS. The English fleet of 49 sail, raised to combat the Spanish Armada, carried 14,872 men; each of the four largest ships had 1000 men aboard. Sir RICHARD HAWKINS, one of the admirals, relates, that in the course of 20 years, he had known of 10,000 seamen having perished of scurvy alone. Scurvy almost invariably broke out in long voyages, which became frequent in the 17th century; . . . fever and dysentery were still more fatal. The Channel fleet sent 11,732 cases of sickness to Haslar Hospital, in 1780; 1457 were cases of scurvy, 240 of flux, 5539 of continued fevers! . . . This is a fair specimen of the health of large fleets down to the end of the 18th century; neither ships nor men could keep the sea for more than two months. . . . The improvement in the health of the Navy during the 36 years from 1779 to 1815, is ascribed by Sir GILBERT BLANE, in the first place, to the general distribution of lemon juice and nitric acid in the Navy, from 1796. Its virtues were previously known, but had never been extensively applied before the appearance of LIND'S classical "Treatise on Scurvy." . . . (2.) To improvements in ventilation and cleanliness. The sailors began to wash themselves and their apparel; they were first allowed soap in 1810; and Earl ST. VINCENT had their hammocks and beds aired twice a week so early as 1800. (3.) The dryness promoted by fires carried about in stoves. (4.) The use of iron for ballast, and of iron tanks for the preservation of water. (5.) Mr. SEPPING'S improvements in the construction of ships, by which cavities under the hold are abolished, where filth and vermin of every description accumulated; . . . (6.) The superior quality of all their articles of victualling; the plentiful supply of fresh meat and vegetables when ships are in port, or within reach of it. (7.) And, finally, the better treatment of the sick.

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MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE

UNITED SERVICES SECTION

AT a meeting of this section held on April 11th, Colonel A. G. BIGGAM, a vice-president, took the chair and a discussion on the organisation of medical services in

Air-raid Precautions

was opened by Colonel E. M. COWELL. He said that it would be necessary to anticipate a casualty inflow of about 22 killed and 40 wounded per ton of bombs dropped. Bombers would attack in closely massed formations of probably not more than 36 machines each, which would cover an area of about a quarter of a square mile. One of these formations would probably cause 1000 casualties in a night attack and 2700 in a day attack. Successive relays of machines might attack the same area. The casualties would, of course, include many women and children, and their handling would be complicated by the presence of friends and relatives. The medical services for air-raid work had been organised on military service lines, and included first-aid parties, first-aid and cleansing posts, ambulance services, cemeteries, and central mortuaries. The medical officer of health was in charge of all arrangements, and medical headquarters must be kept in touch with local authority headquarters and notified of all events. Records must be kept at the Ministry of Pensions so that relatives could be notified of casualties. The Home Office had so far made no provision for the services of consultants. These should be appointed immediately and should assist in the training of medical volunteers. A large medical staff would have to be organised. It would be useless to allow each local authority to organise its own services in isolation. A central staff must coördinate the work of the various authorities, so that if one were overwhelmed by casualties the services of an immune neighbour could come to its assistance. Members of the public would probably have to be given identity discs or medical cards.

A densely populated area required a total personnel equal in size to one-thirtieth of the population. The medical personnel would be one for every fifty. For Croydon, for example, with a population of a quarter of a million, the staff would therefore number 5000. This figure included stretcher-bearers, orderlies, and nurses, and allowed for three eight-hour shifts. The whole medical profession would have to be mobilised. Dental surgeons would be useful as anæsthetists or as assistants to surgeons; no plan had yet been made for mobilising medical students, who would also fill these posts. Territorials might be used, before they were moved on to their training areas; and all ranks should therefore be given some knowledge of stretcher-bearing, protective clothing, and gas.

Air raids would probably be made without warning. Previous propaganda was very important in allaying panic. Each person in a town should carry a shell dressing, and air-raid wardens should carry more than one. These would be more useful than gas respirators. Casualties would be first found by their friends, police, firemen, and air-raid wardens, who would render first-aid and hand them to the ambulance squads, who would carry them to first-aid posts. The Home Office advised the provision of 20 first-aid parties of four men each for every hundred thousand head of population. They must be prepared to work in gas-proof clothing, which was very irksome, and possibly also in respirators and mittens. The most useful form of haversack would have a "zip" fastener and contain a few shell-dressings and triangular bandages. Only the simplest kind of first-aid should be attempted under the difficult conditions of a "black-out." Stretchers were best carried in hip slings, which allowed two men to carry a stretcher with their hands free. The patient would be secured in such a way that the stretcher could be carried in any position. For work in gas, stretchers might have metal poles and a sheet which could be easily decontaminated. Motor ambulances could be quickly improvised from light vans by fitting a rough wooden framework, which any carpenter could make in a short time, to hold stretchers. In the same way railway passenger rolling-stock could quickly be converted to carry stretchers.

Schools were the most suitable places for first-aid posts. Special plumbing, cleansing rooms for gas casualties, and other additions had to be made, at a cost of between £500 and £1000 for each school. The buildings could not be made bomb-proof, but parts of them could be made splinter-proof. They ought to be fireproof, but it would be difficult to make them gas-proof. Trenches should be dug in the playground, revetted, and covered with a layer of sandbags. New hospitals should have flat roofs, which could be covered with concrete to stop incendiary bombs. Casualties would have to be kept in the first-aid posts for some time, and fed to the clearing hospitals in convoys as they could be dealt with. The sexes had better be segregated by screens than in separate buildings, as the ratio of numbers would vary. Each post must have an alternative site, in case it was destroyed, and reserve personnel should be in readiness. The personnel would number fifty, excluding a doctor and four State-registered nurses, for each eight-hour shift.

The casualty clearing hospital would probably have to be established in existing buildings. The local hospital would be the best site, and schools might have to be used as well. The lay-out should be arranged to give the quickest possible access to ambulances and stretcher-bearers. A site at a cross-roads therefore had advantages. Casualty clearing hospitals must be grouped together, and as each one was filled up it should be closed and the next one opened. The pivotal point of each hospital was the theatre block, which was conveniently formed by dividing huts into three theatres and splint room, each theatre to have two tables with an instrument table between them. Base hospitals and storage depôts would also be required. One thousand walking and 700 lying cases could not be dealt with in under 25 or 30 hours.

DISCUSSION

Air Commodore WILLIAM TYRRELL maintained that air defence would have to be arranged on national lines. At present the Home Office, the British Red Cross, and St. John Ambulance were each organising departments to suit their own particular requirements. To meet the realities of the situation the arrangements must be centrally coördinated on basic principles applicable equally to civilian and Service emergencies. Basic text-books would have to be compiled on the same lines as the Home Office publications, with uniformity in terminology, pro-

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cedure, and technique. Application should be elastic enough to fit each set of circumstances. Such control would help considerably to avert the most important result of air attack: panic. Nowadays the base hospital was just as likely to be a target as the first-aid post, so the old Army division into four sectors, with its assumption that casualties would only occur in the forward area, was obsolete. Arrangements for collection must be provided in every part of the country, and each area must be prepared to stand by to help a neighbour which had all its services destroyed. He asked how a gas-contaminated patient who was also suffering from shock and collapse should be treated.

Dr. J. N. DOBBIE pointed to the divided control that at present existed in London. The first-aid posts and parties were under the metropolitan boroughs, and the accommodation for casualties was under the large hospitals and L.C.C. hospitals, which were scattered through the various boroughs. The phrase "casualty clearing hospital" was a misnomer; many casualties would be taken there direct, and it was in the front rank. Casualties would have to be evacuated well outside London. The authorities should consider immediately the establishment of tented hospitals on the periphery. The National Fitness campaign and similar movements requiring large camps would provide opportunity for the Government to establish these hospitals at once. Schools did not make good hospitals, because their ground plan did not allow for a proper flow-through of wheeled transport. The terrible lack of cohesion between the different authorities was a great problem.

Dr. DONALD STEWART said that Colonel Cowell's address was of the greatest practical value to those like himself, who had been asked to draw up a medical A.R.P. scheme for a large community. He had found difficulty so far in obtaining helpful information apart from the excellent handbooks published by the Home Office. If gas was to be a problem in the next war the decontamination of those already severely injured must take an important place in first-aid instruction. Dr. Stewart also emphasised, as an essential part of the scheme, that A.R.P. volunteers should be given systematic general training and some understanding of discipline, not only in order to do their job effectively but also to form a stabilising and "anti-panic" factor in any emergency. If metal stretchers were used, as Colonel Cowell had suggested, the inclusion of some of the new light alloys might reduce lifting weight. Metal stretchers should be decontaminated more easily than those made of canvas and wood. The civilian clothing issued for training purposes was still susceptible of improvement in design. The problem of rehabilitation and return to work of people injured in an air raid should be considered now as part of the whole scheme since emergency measures had a bearing on these problems.

Surgeon-Commander S. G. RAINSFORD said that Admiralty work on the use of gas-proof clothing had shown that men could wear it for a surprisingly long time.

Group Captain G. STRUAN MARSHALL suggested the use of a gas-proof tent made of oiled fabric, impervious from the outside, and containing a small apparatus for absorbing carbon dioxide and releasing oxygen. Its soft walls would stand much blast without breaking. Metal-framed stretchers, even of steels, could be made sufficiently light for practical use.

Dr. W. D. WALKER said that shocked patients should be decontaminated first, but must be kept warm until this was done, and then given normal saline and glucose. All medical officers should have an opportunity to be trained in anti-gas measures. He was anxious for training, but had been unable to obtain it.

Colonel COWELL, in reply, said that his paper would be published in the *Journal of the Royal Army Medical Corps*. He emphasised again the need for central coördination, pointing out that the tactics of air attack made it probable that damage would be localised. Serious cases must not be sent direct to the casualty clearing hospital, or they would swamp it. Of the five general hospitals being organised as base hospitals for London, each was well on the outskirts. He warmly approved the establishment of holiday camps with the idea of conversion into hospitals, but suggested that if they were established now, they would probably be photographed and marked down as targets. They should be planned now, but only erected, under camouflage, when the emergency arose. The difficulty which confronted a local authority in dealing with volunteers was not to recruit them but to maintain their interest for an indefinite period—until either air force was disbanded or the Millennium came!

ABERDEEN MEDICO-CHIRURGICAL SOCIETY

AT a meeting of this society held on April 7th, with Dr. H. E. SMITH, the president, in the chair, an address on the therapeutic uses of progesterone, the corpus luteum hormone, was given by Dr. SUSAN PATERSON (Edinburgh).

Progesterone in Pre-eclamptic Toxæmia

In the course of her address she said that 30 cases of pre-eclampsia had been treated with progesterone, the majority being severe cases. Nephritis was first excluded, and a basic number of precautions were taken—namely (1) a balanced diet of approximately 1650 calories was given, not salt-free and not protein-free, but without red meat; (2) wherever there was much œdema the fluid intake was restricted to less than 40 oz. until the fluid output was greater than the intake; and (3) if headache was severe, phenobarbitone was given. Progesterone was injected intramuscularly in doses of 5 mg. daily for the first three or four days, and thereafter, depending on response, at longer intervals. In certain cases where no response was noted after one day, 10 mg. was given on the second, third, and fourth days. All the patients recovered and only one mother developed fits after treatment had started; they began on the second day. The results obtained in severe cases in the year before progesterone was used and in the following year could be compared as follows:—

	Conservative (31).	Progesterone (22).
Developing fits	10	1
Maternal deaths	3	0
Fœtal deaths	10	7
Corrected fœtal deaths	10 = 32 %	3 = 14 %

The use of corpus luteum hormone in pre-eclamptic toxæmia was suggested by Robson's experiments on rabbits, which seemed to prove that the health of the placenta depended on the health of the corpus luteum and that toxæmia was the direct result of the placenta being no longer healthy. Treatment by

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progesterone was a substitution therapy; it would not revivify areas of placenta damaged past repair, but it would help to maintain the health of the part of the placenta still functioning. Obviously the earlier the deficiency of corpus luteum was recognised and corrected, the better would be the results, and in severe cases of pre-eclampsia, conservative measures (rest in bed, attention to bowels, &c.) were necessary to deal with the toxins in circulation. If this theory was sound, the dangers of eclampsia could be almost eliminated if patients with the earliest signs of pre-eclamptic toxæmia were given progesterone.

Prof. DUGALD BAIRD said that 65 cases of pre-eclampsia had been treated without progesterone at Aberdeen Maternity Hospital in 1937 with no maternal deaths, and 8 fœtal deaths. These results were as good as those achieved with progesterone. If the hormone was to be employed it would probably be most useful at the sixth month in cases with early rise of blood pressure, and without albuminuria.

LIVERPOOL MEDICAL INSTITUTION

A MEETING of the institution was held on March 17th, with Dr. E. GILBERT BARK, the president, in the chair.

Dr. A. G. C. FFOLLIOTT read a note on a case of

Thrombosis of the Inferior Vena Cava

The patient was a married woman, aged 59, with four children. She had suffered from varicose vein in the right leg since the age of 18 without any trouble being caused. Thrombosis occurred in the middle third of the leg and extended proximally at the rate of two inches a day. On the seventh day a non-fatal pulmonary embolus occurred. The thrombosis extended and was indicated by swelling of the right leg when it reached the junction with the femoral vein, swelling of the lower part of the back and buttocks due to obstruction of the hypogastric vein, swelling of the left leg when the junction of the common iliac veins was reached. Eventually suppression of urine and coma occurred, due to obstruction of the renal veins. This persisted for three days, after which time the kidneys began to function, and the patient also made a slow recovery and was now in perfect health. The interesting features were: the steady rate of extension of the thrombosis; the establishment of a collateral circulation by the azygos and hemi-azygos and lumbar veins; the return of kidney function after three days of suppression; and the eventual recovery of the patient from an apparently hopeless condition.

Mr. JOHN ROBERTS communicated observations on 120 consecutive cases of

Foreign Body Removed from the Œsophagus and Lower Air-passages

He said that, apart from children, contributory factors in the ingestion and inhalation of foreign bodies were insanity, alcoholism, dentures which limited the sensitive area of the mouth, hunger, and hurry. Any type of mechanical narrowing of the gullet was a predisposing cause. Halfpennies, fish, and meat bones were by far the most common objects, and the large majority became held up in the upper third of the œsophagus. Mr. Roberts had in his collection a girl-guide badge, a shilling piece, a match stick, a piece of metal from a fruit salad tin, and other articles, but his most unusual case was one reported in 1934 in which a man's gullet became obstructed by his own beard. The bronchial foreign bodies formed only about 5 per cent. of the total, and this series included the only object which he failed to remove. This was a small pin, lodged in the basal periphery of the lower lobe of the left lung. The diagnosis was completed by a competent indirect mirror laryngoscopy followed by a skilled radiological screening with opaque paste and cotton-wool—which very rarely failed to betray or indicate an impacted object. In this connexion Mr. Roberts insisted that a skilled radiological emergency service was vital and the responsibility of diagnosis, except of metallic objects, should not be deputed to a radiographer. Mr. Roberts favoured a modern distally lighted tube—more especially one of oval cross-section. He much preferred a general anæsthetic for œsophagoscopy. He outlined the principles on which it is possible to pass a rigid tube down a curving gullet, and the difficulty of endoscopic examination of patients with rigid vertebral columns. In the two fatal cases in the series the foreign body had penetrated the gullet before the patients arrived for endoscopy.

In the discussion Mr. H. V. FORSTER spoke of the difficulty of removing small foreign bodies in the smaller bronchi or at the periphery of the lung; nowadays the biplane fluoroscope was used to help in the recovery of such a foreign body. If a modern tooth plate of stainless steel should be impacted in the gullet it might be divided by an electrically driven burr. Mr. Forster had been very fortunate in his experience of foreign bodies in the gullet, but might have lost two patients with tooth-plate impaction but for the help of general surgical colleagues, who successfully removed by external operation an upper denture fixed below the sternal margin and one impacted behind the cricoid. Peanuts inhaled into a bronchus caused early and dangerous reactions in the lung. Accidents of this kind were common in America where peanuts eaten at baseball matches during the excitement and cheering sometimes found their way into a bronchus.

Dr. REGINALD GEMMELL called attention to the fact that people as a rule were frightened if they swallowed foreign bodies and immediately asked to be radiographed. He showed lantern slides of a man who chewed and swallowed safety-razor blades for bets.

Dr. COTTON CORNWALL expressed surprise that the proportion of foreign bodies found in the bronchi was so small, and suggested that it might increase if bronchography was performed in doubtful cases, since many foreign bodies were radiologically non-opaque. When there was any doubt whether a foreign body had been swallowed the patient should be radiographed, and when one was found in a bronchus every effort should be made to remove it; otherwise pulmonary suppuration was likely to supervene at a later date.

Dr. MURIEL BARTON HALL contributed a Study of Juvenile Nervous and Mental Instability, based upon records of 1000 consecutive cases of young persons in the second decade of life.

BRITISH SOCIAL HYGIENE COUNCIL.—The council will hold a non-residential school at Friends House, Euston-road, London, N.W., from June 20th to 25th, and a residential school at Granville-court, Hornsea, Yorks. from Sept. 6th to 13th. The programme of lectures at the schools is designed for those who have charge of children, who advise parents, or who care for the welfare of adolescents during their working or leisure hours. Further information may be had from the secretary of the council, Carteret House, Carteret-street, London, S.W.1.

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REVIEWS AND NOTICES OF BOOKS

Text Book of X-Ray Diagnosis

By British Authors. Edited by S. COCHRANE SHANKS, M.D., Physician in Charge of Out-patients, Departments of Radiology and Electrotherapy, Charing Cross Hospital; Radiologist, Prince of Wales General Hospital; PETER KERLEY, M.D., M.R.C.P., D.M.R.E., Physician to the X Ray Department, Westminster Hospital; Radiologist, Royal Chest Hospital; and E. W. TWINING, M.R.C.S., D.M.R.E., Radiologist, Royal Infirmary, Manchester; Radiologist, Christie Hospital. London: H. K. Lewis and Co. 1938. Vol. I. Pp. 591. 50*s*. Vol. II. Pp. 458. 42*s*.

THIS excellent text-book will be welcomed, not only by radiologists but by all whose interests require authoritative reference to expert opinion on diagnostic points.

The first volume consists of three main sections: the cardiovascular system by Peter Kerley, the respiratory system by E. W. Twining, and the urinary and male genital tracts by C. Jennings Marshall and S. Cochrane Shanks. The cardiovascular section is not very long, but it provides all that is likely to be required in a work of this kind. The special techniques, orthodiagraphy, cineradiography, kymography, and so forth, are described though not in detail, and a simple but adequate account is given of X ray measurements of the cardiovascular shadow. The illustrations are well chosen and the reproduction is so good that all the points referred to in the text are clearly visible. The radiograms of congenital diseases of the heart are particularly striking. The author believes that arteriography will come into use in the future, but rightly deprecates the use of Thorotrast because of the possible carcinogenic properties of the radioactive thorium.

The second section begins with a note on the technique of examination of the chest, which is both practical and thorough. Dr. Twining finds only a limited sphere of usefulness for stereoscopy, but recommends tomography for the location of cavities and bronchial obstruction. The apparatus he himself uses for this purpose is simple in structure and gives effective results. His anatomical diagrams will help all who seek to interpret the relations of complicated structures projected on the screen. The outline of the bronchi is made clear by lipiodol injection, which also shows up such abnormalities as bronchiectasis, congenital cystic lung, and bronchial carcinoma with precision. The shadows due to consolidation from pneumonia, fibrosis, and other causes and their differential diagnosis are discussed and a representative selection of typical tuberculous lesions is portrayed. An authoritative chapter on mediastinal tumours includes such rare types as neurofibroma and thymoma. Some pathologists will not agree with the suggestion that lympho-epithelioma may be found in the thymus, as it is known that reticulum-cell sarcoma can produce the appearance described. The chapter on primary neoplasm of the lung is particularly valuable because of the number of different types it has been possible to illustrate and, although this variety of form indicates the difficulty of diagnosis, radiologists confronted with a doubtful case will certainly gain confidence from its study. A separate chapter is devoted to diseases of the pleura, wherein interlobar effusions are particularly well described.

The section on the urinary tract includes an account of the preparation of the patient and of the radiographic technique for plain films and for intravenous and retrograde urography. The views of the authors on neuromuscular dysfunction in the urinary tract seem to explain certain rare but puzzling pathological syndromes. The radiograms of congenital cystic kidney and of simple and malignant tumours are particularly good, and an unusual illustration shows filling defects caused by blood clots. The differential diagnosis of urinary calculus is always important; the view put forward here is that the site and shape of the opacity are relevant, but that the respiratory shift is too uncertain to be worth estimating. Urography, either intravenous or retrograde, will practically always settle the question whether a stone is present, either in kidney or ureter.

In the second volume Dr. Shanks has taken responsibility for the alimentary tract and the abdomen with the coöperation of Dr. J. St. George Wilson; Dr. Kerley writes on the biliary tract; and Dr. R. E. Roberts on the female genital tract and obstetrics. The alimentary tract has been carefully analysed. Few conditions which could possibly be observed radiologically have been omitted. The importance of watching on the screen the passage of the opaque medium into the stomach in carcinoma of the lower end of the œsophagus might have been emphasised and the description of the control of the entry of the barium enema by pressure of the operator's hand and the posture of the patient are not perhaps sufficiently detailed. Peptic ulceration, both in stomach and duodenum, is particularly well shown. Figures 32 and 33 (gastric), 64 (malignant), and 86, 87, and 88 (duodenal) demand special attention. The chapter on the stomach and duodenum after operation is likely to give help where it is sorely needed. Regional ileitis (Crohn's disease) is clearly described, but there is no mention of a similar condition occasionally found in other parts of the bowel, where it may also be mistaken for malignant disease. The vexed question of the diagnosis of chronic appendicitis is discussed but, although some obviously pathological appendices are illustrated, no stress is laid on the value of radiological signs in this connexion. The account of the thorium air double contrast enema and its uses is excellent and timely. Dr. Kerley's section on the biliary tract shows acute observation; the technique he advises for oral cholecystography appears to be entirely satisfactory in his hands and there seems to be no reason why it should not give equally good results in others.

For the visualisation of the female genital tract, utero-salpingography with lipiodol is recommended by Dr Roberts. The method used is simple and the films obtained show that it is satisfactory. Obstetrical chapters include the early diagnosis of pregnancy, radiological pelvimetry, cephalometry, and the radiological estimation of fœtal maturity, and of the position, presentation, and abnormalities of the fœtus. Various methods are described for pelvimetry and correction tables for Dr. Roberts's own method are supplied. The diameters of both inlet and outlet are measured. The diagnosis of placenta prævia may be attempted from the plain film or by amniography, but a warning is given that the latter method should not be used unless immediate induction of labour or Cæsarean section is contemplated.

The last volume of this ambitious work is yet to come. But since two-thirds of it has well main-

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tained a very high standard, there can be no reason to await completion before prophesying its early recognition as a classic among specialised British text-books.

1937 Year Book of General Surgery

Edited by EVARTS A. GRAHAM, A.B., M.D., Professor of Surgery, Washington University School of Medicine. London: H. K. Lewis and Co. 1937. Pp. 827. 12s. 6d.

IMPORTANT contributions to surgical literature are nowadays spread over so many periodicals that even the specialist finds it difficult to keep abreast of his subject. The general surgeon, however industrious, has to face a task which would be entirely beyond his powers were it not for the help afforded him by such publications as this year book, and he owes a great debt of gratitude to the editor and his collaborators for their judgment in selecting, and their skill in summarising, the numerous papers referred to in the present volume. It is natural that a large proportion of the abstracts should refer to matters of technique, details of wound treatment, the use of chemical and physical agents to promote healing, and to many similar modifications or innovations in surgical craftsmanship. But this book is remarkable for the number of comparatively new principles commented upon, and for several critical reviews which help to clarify our ideas about certain controversial subjects. In the former group are the notes on the management of cerebral abscess, the clinical studies of arterial occlusion, the treatment of cardiac ischæmia, and the recognition of the part played by protrusion of an intervertebral disc into the spinal canal in some cases of sciatica. Among the reviews special attention should be paid to those on tuberculous cervical lymphadenitis, thyroid adenomas, and cholelithiasis; and other matters of considerable importance are the use of cortin after burns, the modifications in maggot therapy for infected wounds, and the treatment of fractures of the internal epicondyle of the humerus. In spite of the myriads of papers on the subject, appendicitis still maintains its steady mortality-rate, but we should be thankful that in this country we are less familiar than are our American colleagues with what they call biliary peritonitis. We must add a special word of praise for the brief notes by the editor; the opinions based upon his personal experience do much to enrich the volume.

Fractures and Dislocations for Practitioners

By EDWIN O. GECKELER, M.D., F.A.C.S., Fellow of the American Academy of Orthopedic Surgeons. London: Baillière, Tindall and Cox. 1937. Pp. 252. 18s.

Dr. Geckeler's book sets out to supply concise yet detailed instruction in the management of the more common fractures and dislocations, and is written chiefly for those whose work brings them into daily contact with injuries. Practical considerations are therefore emphasised; one method of treatment alone, in the author's opinion the most useful one, has been described in each case, and the illustrations have been chosen to explain its application in elaborate detail. The whole is full of common sense and contains the shrewd suggestions of one in daily contact with the problems he discusses. An unusual feature in a book of this size, but a commendable one, is the inclusion of a chapter on the fractures of the skull and bones of the face.

Some of the methods differ, as might be expected, from those advocated in this country. The author advises the treatment of fractures of the surgical neck of the humerus in abduction, a position that has been accepted too long on the pseudo-anatomical advice of the Vienna school, and only lately discredited. Full flexion is recommended in the fixation of elbow fractures, without sufficient insistence on its dangers. Early movement in wrist fractures and the subdivision of those at the ankle into many groups are strange to our practice and teaching. The book is nevertheless an excellent one, and may be recommended to those requiring a short treatise on fractures and dislocations which is clear, practical, and well illustrated.

Elements of Medical Treatment

Third edition. By ROBERT HUTCHISON, M.D., Hon. D.Sc. Oxon., F.R.C.P., Consulting Physician to the London Hospital and to the Hospital for Sick Children, Great Ormond-street. Bristol: John Wright and Sons; London: Simpkin Marshall. 1937. Pp. 194. 5s.

WHILE Dr. Hutchison's name is on the lips of all his London colleagues as that of the newly elected president of the Royal College of Physicians, it is opportune to remind the wider world of students (and their teachers) in the medical schools of the Empire that he published last year a new edition of this little book on medical treatment. It appeared first in 1926 as a printed version of his London Hospital lectures on elementary therapeutics. It was not a text-book. It just talked about the treatment of some of the commoner diseases and symptoms in such a way as to display the principles that must always govern the right management of patient by doctor. It also gave special attention to prescription-writing, not of the old florid variety but with simplicity and sense. The third edition is little changed: mention of mandelic acid, newer mercurial diuretics, and the like serve to keep the examples up to date, but, naturally, the principles remain the same, and a great deal of therapeutic wisdom is packed into a small space. Students should go on reading this book, especially when their minds are congested with overmuch learning or confused with overmuch teaching; and those of us who have heard or read it already should look through it again, to be refreshed by its directness and common sense and to be reminded of some of the familiar Hutchisonian phrases and quotations.

Disability Evaluation

Second edition. By EARL D. MCBRIDE, B.S., M.D., F.A.C.S., Assistant Professor in Orthopedic Surgery, University of Oklahoma School of Medicine. London: J. B. Lippincott Company. 1938. Pp. 623. 38s.

THIS book is an attempt to estimate "personal incapacity" following injury "with arithmetical preciseness." For the man who has already had considerable experience in examining injured workmen and also has a knowledge of working conditions it has undoubted value; but it would be a dangerous tool in the hands of less experienced practitioners. The second edition differs from the first, published in 1936 and reviewed last year in our columns, only in so far that its second paragraph has been brought up to date by the inclusion of certain figures supplied by the National Safety Council in their report for 1936 of the costs of occupational accidents.

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THE LANCET

LONDON: SATURDAY, APRIL 23, 1938

AN OVERCROWDED PROFESSION?

THE Government has now given us a definition of an overcrowded house, but we have no definition of an overcrowded profession. In our last issue two correspondents described the medical profession in this country as greatly overcrowded. What did they mean? Had they in mind some particular criterion; for example, that the number of doctors must not exceed one per thousand of the population? Were they regretting that they and their fellow M.R.C.P.'s and F.R.C.S.'s have less chance than their elders had of earning £4000 a year in consulting practice? Or has it been their experience that competent men cannot get a living at all? This last is presumably the probable explanation, for one of them remarked that there may be as many as thirty excellent applicants for a single post. Yet we are left wondering whether this is not quite exceptional. At the nadir of the recent trade depression it was rare for a medical man or woman in sound health to be unable to find some employment, and to-day many provincial hospitals seem to have difficulty in securing all the staff they need. A hospital asking for an assistant secretary at quite a low salary may get a hundred applications, often from men of wide experience; while the same hospital may have few replies, or none, to its advertisement for a house surgeon. At a time when constructional work was at a minimum the medical profession seemed especially favoured, and in the renewal of prosperity it has indirectly had its share.

The immediate reason for raising this cry that the profession is overcrowded is the influx of Jews from Germany and the potential influx of Jews from Austria. The anxiety expressed about this invasion seems excessive when one learns that since 1933 only 187 medical refugees from Germany have been allowed to settle and follow their profession in this country[1]—a figure which represents only 0·31 per cent. of the names on the Register. Somewhat unfortunately, however, it happens that many of these have undertaken medical work in a quarter where there really does seem to be overcrowding—that is to say, in a branch of work where there are not enough fees to provide adequate incomes for everyone—and the molehill they have created is apt to look slightly mountainous. It is true that the intensification of competition that has resulted from the addition of a few German names to the door-plates of the Harley-street area can really be having very little effect on the actual incomes of doctors already established there. The overcrowding of Harley-street is a social phenomenon with old endogenous causes far more important than the new exogenous ones. Yet if there were only a single German refugee in consulting practice, his presence might still rankle if he appeared to be taking advantage of the hospitality which has been extended to him (however ungraciously) by this country. And there is in fact a touch of unfairness in the competition. At first sight one might suppose it would be extraordinarily difficult for any such person to establish himself without the advantage of hospital appointments or a wide acquaintance; all the cards seem to be against the refugee. But this is not so. Some of those now in London have apparently been able to retain money enough for a good start in practice, and all have profited by the belief of the public in the superior merits of foreign doctors—a belief by no means diminished by references, in newspapers and elsewhere, to the distinction of the scientists who have been forced out of Germany. When a man without English hospital connexions secures within a year or two a practice that appears as large as those of many consultants long known and much esteemed, it is only natural that his hosts (and competitors) should wonder whether his success is wholly based on merit. To speak plainly, the prosperity so speedily attained by some refugees has done more than anything else to weaken the desire to help refugees as a class. The alternative to such help, however, is a further degradation of English tradition. Already our former reputation for generosity to those who are in trouble because of conscience or race has passed to the French; for France (with less general unemployment) has maintained herself as the sanctuary of Europe. Before abandoning what remains of the toleration our forefathers showed, let us at least be sure that something tangible is gained.

Overcrowding—or wrong distribution? Over-production—or under-consumption? This is all part of the fundamental economic problem of the day. Dr. HUGH CABOT'S comment[2] on the situation in the United States seems to us equally applicable to Great Britain:—

> "The question of whether or not there are too many physicians depends entirely upon our decision as to what we propose to do about providing medical care for those who do not now receive it. It also depends upon whether a more adequate distribution of physicians is to be attained. That there is work which could be done to great advantage by all of the physicians now licensed in this country seems to me perfectly clear. That they are not well employed, and that their incomes are insufficient, do not seem to me conclusive arguments for restriction of numbers."

At present the number of students seeking to enter the profession each year depends largely on its reputation as a means of livelihood compared with other occupations. That reputation may be too high; the public may be deceived into thinking

[1] Wright, S., *Lancet*, April 9th, 1938, p. 865.

[2] Cabot, Hugh The Doctor's Bill, New York, 1935, p. 260.

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that medical practice is more remunerative than it really is for the average practitioner. The remedy for this is better information, both about the present and about the future, and in a useful paper on Demand and Supply in the Learned Professions Prof. W. M. KOTSCHNIG,[3] an American educationist, recommends the appointment of commissions that would keep the public in touch with the facts and would try to foretell the medical needs of the nation a few years hence. Such "planning commissions" would have to contain not only doctors but experts in economics and government, as well as social workers and other representatives of the public. KOTSCHNIG does not propose that their decisions should be the basis of limitation by governments, as already enforced in some countries, but merely that they should provide parents and guardians with sound information about prospects of employment, not only in the medical profession but in alternative occupations. He rightly thinks it important that the profession itself should not take the responsibility of keeping down the number of new entrants; for, as CABOT says, it would be unwise to imitate the behaviour of the old guilds which he accuses of being primarily concerned with the maintenance of high privileges and remuneration. But though the interests of the public must always be the first consideration, this in itself means that the doctor must be safeguarded wherever possible against disaster; for lack of work and money must sooner or later lead to lowering of standards. Anyone who goes through a long and expensive course of instruction, which is of little commercial value if he leaves medicine, should have at least a good prospect of securing work when he is qualified. In relation to general education the same kind of argument is now being put forward by Prof. J. B. CONANT, the president of Harvard, who believes that the total of university students in the United States needs reduction.[3] KOTSCHNIG will not be alone in deprecating any tendency towards what he calls "general intellectual Malthusianism," but we shall all agree that it is a mistake to give boys and girls a genuinely vocational training unless one can later offer them the appropriate work. The more elaborate and specialised the training, the more is this important. It would be wrong, however, to suppose that medicine is the only pursuit to which such rules apply. If there is a risk of over-production of personnel in this country, it affects architects, engineers, coal-miners, and a great many other specialists, more than it affects doctors. "Over-production" runs through all the social strata, and during the next trade depression one can imagine one of KOTSCHNIG'S planning commissions issuing the statement that *all* the known occupations of mankind (except nursing and domestic service) are overfilled. What should we do then? Reduce the birth-rate? That might be an unnecessarily remote means of improving a world in which one cannot walk ten yards without seeing work that badly needs doing.

[3] Kotschnig, W. M., *J. Amer. med. Ass.* March 26th, 1938, p. 941.

VULVO-VAGINITIS

THIS week we publish in abridged form the conclusions reached by a committee of the London County Council on vulvo-vaginitis in children and also those based on Mrs. MARGARET ROBKE'S long personal experience as director of the Marlborough clinic at the Royal Free Hospital and in practice. The main points emerging are: (1) the comparatively small proportion of cases which are gonococcal in origin—and incidentally the small proportion of these which are due to direct infection by assault; (2) the comparatively non-infective character of the infections due to organisms other than the gonococcus; (3) the importance of general and medicinal as opposed to local methods of treatment. The L.C.C. report deals with a period before the value of preparations of the sulphanilamide group could be assessed but when it was already perceived, and Mrs. ROBKE leaves no doubt of the dramatic effect of this group of drugs. It is of interest that œstrin by the mouth changes beneficially the character of purulent vaginal discharge by stimulating a change of the vaginal mucous membrane towards the adult resistant type, but does not affect the associated urethral (very common) and rectal (less common) inflammation. The criteria of cure suggested by the committee—negative tests for *four* months after cessation of all treatment—are even more rigid than those insisted on by Mrs. ROBKE. They recognise, however, that long-continued observation tends to perpetuate anxiety in those responsible for the child, to keep up bad habits if they exist, and to fix in the memory an unfortunate experience and propose that when all is well six months after cessation of treatment such observations should cease. The details given for collecting material for bacterial diagnosis, for the conduct of laboratory tests, and for general and local routine treatment, including precautions to be taken by nurses, will be invaluable to those whose experience of these troublesome infections is so limited that their incidence seems even more of a calamity than it need prove to be. Hints that the organisation of games, singing, and lessons prevent the dangers associated with idle hands should not be lost; the minutiæ—as that Playfair probes "should be *carefully* and *evenly* dressed . . . with the best quality cotton-wool," eliminating the irregularities of substance and friability of the cheap short-fibred wool—are all based on practical experience. The fact emerges, too, that over-treatment is responsible for keeping up or even increasing a vaginitis. A practical difficulty in completing the rehabilitation of patients, especially the rare persistent or chronic relapsing ones, is to find accommodation during their recovery, since convalescent homes hardly welcome children with a recent history of vulvo-vaginitis from whatever cause. It is reassuring to learn that however persistent the discharge, or wearisome the relapses, there seems to be no direct evidence of gonococcal vaginitis contracted in childhood lasting into adult life.

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"ECONOMIC SECURITY AND WELL-BEING"

PROPOSALS for the extension of old-age pensions and national health insurance are made in a pamphlet[1] prepared by five members of the National Labour Organisation, one of whom, Sir JOHN WORTHINGTON, is a medical man and deputy chairman of the organisation. They are offered as "a notable and welcome advance in the economic security and well-being of the nation." The signatories hold that the pensions insurance scheme has two serious defects. First, the pension is inadequate for persons dependent on it for support; the authors estimate that over 50 per cent. of the pensioners are either a burden on wage-earning relations or dependent on public or private charity. Secondly, the pension is often superfluous, since many men and some women pensioners are earning full wages; it is estimated that such pensioners number over 400,000, and that the number is increasing with the increased demand for labour. The authors propose that from 1943 the weekly pension should be raised from 10*s.* to 20*s.* for insured men, and from 10*s.* to 15*s.* for insured spinsters, and that the wife of an insured man should receive her pension of 10*s.* at age 60 instead of 65. The increased cost would, they estimate, be met by an additional weekly contribution, beginning in 1938, of 4*d.*, to be shared equally by employers and employed, and an Exchequer grant equivalent to 2*d.* for each contribution paid. From 1943 the pensions would not be payable without a declaration of retirement from wage-earning. The retired pensioner would not be forbidden to work on his own account or to do occasional odd jobs, but he would be required not "to re-enter wage-earning employment in excess of (say) one week in any period of four weeks." The authors make this proposal because they believe that a higher pension involving retirement "would mean more jobs for the unemployed men and women in the prime of life." They state that wage-earning pensioners are criticised by their fellow-workers, and that for this reason some wage-earners do not claim pensions to which they are entitled.

It is also proposed that medical benefit should be extended to the dependants of insured persons —i.e., one adult dependant and dependent children not over school age. This, it is estimated, would add 15 million dependants to the 18 million insured persons in Great Britain, and would increase the annual cost of the health insurance scheme by £7 million, equivalent to an extra weekly contribution of 2*d.*, to be shared equally by the insured persons and the Exchequer. This estimate is based on the assumption that the insurance doctors would accept a capitation fee of 6*s.* for the dependants, and that 2*s.* 10½*d.* would cover the cost of drugs, mileage, and administration, these being the amounts recommended by the departmental committee on Scottish Health Services. The authors think a 6*s.* capitation fee for dependants would "build up a considerably larger fund for the doctors than any income which they now derive from this class." The final proposal is that voluntary insurance should be extended to small traders and salaried workers earning not more than £400, and to their dependants. The changes proposed would be costly, involving an increase of 3*d.* in the weekly contribution of the insured persons, and it may be contended that the money required for the health insurance extensions could more profitably be spent in developing the preventive work of the local authorities—e.g., in the provision of many more nursery schools and other maternity and child welfare agencies. It is doubtful too whether the compulsory retirement of pensioners from work would be administratively practicable, or can be regarded as a sound method of dealing with unemployment. But the proposals are evidently the result of much thought, and merit careful consideration.

[1] Proposals for the Extension of Old Age Pensions and National Health Insurance. London: P. S. King and Son. Pp. 19. 6*d.*

EXPERIMENTAL ANILINE CANCER OF THE BLADDER

ANILINE cancer of the bladder has at last been reproduced experimentally. This has been achieved by HUEPER, WILEY, WOLFE, and others[1] mainly by the use of the right animal and very large doses of the test substance, and their success is the more creditable in that it follows a number of attempts all of which have failed to achieve their object.

When six years ago BERENBLUM[2] reviewed the whole subject of aniline cancer of the bladder, he drew attention to the disappointing results of all attempts to get more knowledge of the ætiology of the condition, by methods other than statistical compilations, or to discover the mode of ingestion of the carcinogenic substance, of the path through which it acts on the bladder mucosa, and of its chemical nature when it gets there. According to figures compiled by BERENBLUM the most suspected chemicals in the dye industry are benzidine, aniline, and naphthylamine. HUEPER and his colleagues chose to test beta-naphthylamine and used mongrel female dogs of sufficient size to allow the passage of a cystoscope, so that direct observations could be made on the bladder before and during treatment. Thirteen dogs out of sixteen developed papillomas and carcinomas in a period of 20 to 26 months, by combined oral feeding and subcutaneous injection. This latent period of about 2 years, or one-sixth of the normal life span of a dog, corresponds fairly well with the latent period of 7–10 years for carcinogenic agents acting on man. The proportion of lesions to animals exposed to the agent is greater than occurs in industrial conditions in man, but the dosage was probably immensely greater. Whether beta-naphthylamine or an impurity associated with it, or a urinary metabolite, is the actual carcinogenic chemical, has not yet been determined but

[1] Hueper, W. C., Wiley, F. H., and Wolfe, H. D., *J. industr. Hyg.* 1938, 20, 46.
[2] Berenblum, I., *Cancer Rev.* 1932, 7, 337.

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the means to identify it are now at hand. The method of entry into the human subject, now believed to be by inhalation, is also still to seek. The authors are under the impression that the massive oral doses given to the dogs in the last year of the experimental period were mainly responsible for their results. To the controversy whether the carcinogenic chemical is carried by the blood stream to the bladder where it manifests a special affinity, or whether it is excreted in the urine and acts on the bladder mucosa because it is in contact with that part of the urinary tract longer than any other, HUEPER and his colleagues have contributed some most pertinent comment. They hold the latter theory, for various reasons including the correspondence between the site of the lesions in man and dogs. In man they occur in the lower half of the bladder especially in the trigonal region; in dogs they are found in the most dependent part of the organ, that is the anterior wall and distal portions of the lateral and posterior walls when the animal is lying down. These are the sites in each case where urine remains longest in contact with the epithelium. During the course of this experiment material for biopsy was removed at intervals and the histology of this material is described as well as that of the fully developed papillomas and carcinomas. It is clear that this work puts us in a fair way to the solution of several of the problems connected with this important industrial disease and has laid the foundation for further work.

ANNOTATIONS

JAUNDICE AND JOINTS

FOR the last four or five years Dr. Philip Hench, of the Mayo Clinic, has been looking for confirmatory evidence of the observation he made in 1929 that the swelling and pain in the joints of a patient with rheumatoid arthritis subsided with the incidental development of a catarrhal jaundice and did not return in their former degree for some months. He now [1] has 28 examples of this phenomenon in rheumatoid arthritis and 12 in patients with peri-articular fibrositis. The jaundice was usually of the toxic or infective variety, attributable either to cincophen or to an unknown infection, but in two instances was due to obstruction by stone. The relief of pain and stiffness due to active inflammatory change in joints is often described as prompt and dramatic, and sometimes caused the patients much surprise; several of them, after their jaundice had recovered and their arthritis relapsed, longed again to exchange the latter for the former. A series of 13 cases of joint disease of various kinds, in which jaundice occurred without relieving pain, serves as a partial control, and suggests that a moderately severe rather than a mild jaundice is necessary to produce the effect on rheumatoid arthritis, while even a severe jaundice is without effect on gout. The phenomenon is therefore thought to be more than a mere analgesic relief of pain, especially since tenderness, muscular spasm, and even swelling of joints were also diminished. There seems little doubt, from the case records and spontaneous accounts given by patients, that the relation between jaundice and joint symptoms was something more than fortuitous. It is obviously desirable that the sequence of events should be watched for by others and when observed carefully reported; and it was certainly worth investigating it experimentally, as Drs. H. E. Thompson and B. L. Wyatt [2] in another part of America proceeded to do. After observing themselves several examples of jaundice-evoked remissions, they tried giving rheumatoid arthritic patients injections of bile salts and of bilirubin. Neither decholin sodium (2 g. daily intravenously) nor bilirubin (10–15 mg. per kg. daily intravenously) had any effect on the arthritic symptoms, although the latter sufficed to produce slight jaundice. But when both bile salt and bilirubin were given together, daily for about ten days, an amelioration was observed. Ten patients so treated all experienced relief of pain and diminution of swelling sooner or later in the period of treatment, and the remission of symptoms lasted up to three weeks. This looks like confirmation of Hench's thesis, although he himself, in his first attempts to repeat Thompson and Wyatt's work, failed to obtain similar results; the discrepancy was attributed to technical errors in the preparation of the bilirubin-bile-salt infusions. No doubt more will be heard of Hench's phenomenon, from both clinical and experimental aspects. It is to be hoped that no rash attempts will be made to treat rheumatoid arthritis blindly by some form of induced jaundice, but that the clue here offered may lead to a clearer understanding of the mechanism of the joint changes, on which in turn a rational if still only symptomatic treatment may be based.

Dr. Hench described his work at the third session of the Bath congress, and a report of his communication appeared in our issue of April 9th (p. 859).

[1] *Arch. intern. Med.* March, 1938, p. 451.
[2] *Ibid*, p. 481.

THE OBSTETRIC BINDER

BINDERS for babies have been the subject of heated argument; binders for mothers seem to have aroused comparatively little excitement. It has long been the custom to introduce a pad under the abdominal bandage after the removal of a large ovarian cyst; yet although the tumour removed from the abdomen during the second stage of labour is considerably larger than most cysts, it is often not considered necessary to bind the abdomen at all. A revival of interest in the benefits obtained from moderate external pressure after delivery followed the choice by Prof. Miles Phillips of the rational use of the obstetric binder as the subject of the Joseph Price oration to the American Association of Obstetricians, Gynecologists, and Abdominal Surgeons in September 1936,[1] and reference is made to this address not only in the eighth edition of Eden and Holland's Manual of Obstetrics, published last year, but in Mr. G. F. Gibberd's new short text-book.[2]

Since the middle of the seventeenth century many authors have referred to the binder, and have advised its use for a variety of purposes, with the result that it has wandered up and down the trunk from the mammæ to the great trochanters, and has been made from anything from the skin of a black sheep, slaughtered in the lying-in chamber, to more

[1] Transactions of the American Association of Obstetricians, Gynecologists, and Abdominal Surgeons for 1936, pp. 14–28.
[2] A Short Textbook of Midwifery. By G. F. Gibberd, M.B., M.S., F.R.C.S., M.C.O.G. London: J. and A. Churchill. 1938. Pp. 529. 15*s*.

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ordinary materials. To William Smellie belongs the credit of first applying the binder in the right place, at the right time, and for the right purpose. In 1752 Smellie realised that the emptying of the distended abdomen might be accompanied by collapse, and that this was due to the rush of blood to the relaxed vessels of the abdominal contents. "The pressure being thus suddenly removed, the head is all at once robbed of its proportion of blood, and the immediate revulsion precipitates the patient into dangerous lypothymia." He therefore used, after delivery, a skirt with a broad head-band which was pinned firmly over a pad to compress the viscera and the relaxed parietes. He went so far as to order an assistant to compress the belly until the binder was in position. Prof. Phillips had records made as a routine for seven years of the blood pressure before, during, and after labour, and was struck with the frequency of a pronounced fall even in normal cases. He found that compression of the upper abdomen might be followed by an increase in the systolic pressure of 10 mm. Hg. His practice is to apply a binder 7 in. wide to the abdomen above the empty uterus with a folded towel underneath. Admittedly this procedure is mostly unnecessary, but it can do no harm. Every obstetrician sooner or later meets a case of extreme shock following normal or, particularly, abnormally rapid labour. Every year a number of women lose their lives from this cause alone. It would certainly be worth trying to reduce the number of these deaths by the routine use of a small binder. Such a binder need not be uncomfortable. It does not conceal the uterus because it does not come below the umbilicus, and it can be removed after twenty-four hours when its work will be done.

CAPILLARY BLOOD FLOW

THE question as to whether human capillaries possess a local occlusive mechanism, not dependent upon general circulatory conditions, has long been debated. The Rouget cells which are alleged to be responsible for capillary contraction in the frog have not been demonstrated in man, and although their absence does not necessarily imply a lack of focal contractility, it does suggest that different conditions govern capillary activity. The theory of spontaneous intermittent activity of individual capillaries put forward by A. Krogh in 1922 was rejected in 1926 by Sir Thomas Lewis, so far as the capillaries of the human skin are concerned.[1] Lewis's conclusions were based chiefly on observations of the vessels of the skin of the back of the hand, a region where the capillaries are visible only with some difficulty. According to Bordley et al.[2] the skin over the tibia affords a better site for the study of cutaneous capillaries, partly because in this situation the skin is relatively transparent, and partly because the plane of many of the capillary loops subtends a very small angle to the surface of the skin, so that the vessels here pursue a reasonably long course more or less parallel to the surface. Under these conditions of optimum visibility, Bordley and his co-workers have observed frequent and long interruptions in capillary blood flow. The pauses in neighbouring capillaries are not simultaneous; the flow in one capillary may continue unabated, while that in an adjacent capillary, arising from the same arteriole, may be interrupted many times. These characteristic and independent intermissions of flow continue to occur without material alteration when the venous pressure is raised by means of a pneumatic cuff round the limb. The intermissions in capillary circulation are therefore not due to variations in any passive resistance, but to some active local reaction which is even able to overcome a moderately raised resistance. When the blood flow in a capillary stops, the arterial end of the vessel is generally empty, even in the presence of an increased venous pressure. It seems that the capillary is occluded by some mechanism not far from the arterio-capillary junction. Sometimes a capillary seems to be occluded at several points along its course. The capillary wall itself is invisible under the conditions of the experiments, and Bordley and his associates are not able to offer any clue as to whether the cessation of blood flow is brought about by the contraction of Rouget cells or by the swelling of endothelial cells. They conclude that the observations indicate that the capillaries are endowed with an occlusive mechanism which may prevent the passage of blood through their lumina. In the light of the observations of E. R. Clark and E. L. Clark[3] this conclusion does not appear entirely justifiable. By using a transparent chamber in the rabbit's ear the Clarks were able to see the capillary wall, and frequently observed the changes described by Bordley without ever seeing alteration in the diameter of the capillary lumen itself. They concluded that there is no evidence that mammalian capillaries in normal circumstances contract independently. This question is not yet settled, since H. K. Beecher,[4] whom Bordley quotes, using the Clarks's technique in Krogh's laboratory, observed contraction of the capillaries in normal circumstances.

The difference between the observations of Lewis and those of Bordley may arise from the fact that they observed different areas of skin. The skin of the hand, observed by Lewis, plays a rôle in the dissipation of body heat, and at the higher temperatures at which Lewis observed it might reasonably be expected to display vessels wide open to favour the transfer of heat. In the skin which Bordley examined the minute blood-vessels are of less importance in heat regulation and might open and close in response to local tissue needs.

THE OBSESSIONAL PATIENT

IT is impossible to investigate a special problem of psychopathology without being forced back to general problems of normal mental life. A penetrating study of the psychopathology of obsessions[5] by Dr. Erwin Straus illustrates this. Beginning with the horror of death shown by a severely obsessional patient, he refers this very characteristic symptom to the disgust which decay universally arouses, and he examines how far the quality of being in decay (*das Verwesende*) is a necessary or accidental (in the Aristotelian sense of the word) manifest or hidden attribute of the object which arouses disgust. It is, he concludes, accidental and hidden. In elucidating this he discusses the inconstant part played by the object in determining the emotional aspect of the perceptual process, and the pathology of those "sympathetic relationships" to which he would refer obsessional phenomena, and which he regards as the link between obsessions and schizophrenia, just as the link with melancholia lies in the incapacity to treat the past as done with. On the time-disturbance he writes with brevity but much authority

[1] Lewis, T., *Heart*, 1926, 13, 1.
[2] Bordley, J., Grow, M. H., and Sherman, W. B., *Bull. Johns Hopk. Hosp.* January, 1938, p. 1.
[3] Clark, E. R., and Clark, E. L., *Amer. J. Anat.* 1935, 57, 385.
[4] Beecher, H. K., *Skand. Arch. Physiol.* 1936, 73, 1.
[5] *Mschr. Psychiat. Neurol.* 1938, 98, 61.

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in view of his well-known studies of *Zeiterlebnis* in other mental anomalies. The obsessional patient, according to Straus, lives in a peculiar world, permeated by decay; a world fundamentally different from that of the normal man. Straus will not concede any analogy, much less essential identity, between such a normal experience as the familiar "having a tune run through one's head" and genuine obsessional symptoms. He holds that the heredity, course, and resistiveness to psychotherapy of the obsessional illness puts it among the endogenous psychoses, and —in opposition to the Freudian interpretation—that the obsessional patient is incapable of changing his total conduct under the influence of psychological treatment. Straus recognises how similar the greed, excessive precision, uncertainty, and other features of the obsessional appear to these proclivities in the normal, but believes there is an essential difference none the less, consisting in the lack of composure, of ability to cope with the necessary inconclusiveness of all behaviour, which makes the obsessional patient prefer ordered plans to changing events and decisions, and makes him wish to reverse what has already happened. He wants to substitute certainty where only an opinion is possible; wants an impersonal scheme wherewith to meet personal responsibilities. Of that incessant doubt which has given the condition one of its names, Straus believes that it occurs, especially in its form of vain searching for ultimate causes, because the patient is debarred from feeling in communion with his world (as religion or tradition might otherwise make him), and from resignedly or complacently letting things go—attitudes which sustain healthy people in a world of vicissitudes, of provisional or hidden events. The ceremonial of which the obsessional makes use to defend himself against a world full of decay is, anthropologically regarded, of a piece with primitive magic.

THE OLD ASHMOLEAN MUSEUM

THANKS to the generosity of the Friends of the Old Ashmolean it has now become possible to complete the series of armorial windows on the main staircase of the Old Ashmolean building at Oxford which, it has been decreed by the University, will wholly return to its original use as a scientific institution. In the presentation of the last window, which is expected to be ready for fixing by the end of May, the Royal College of Physicians of London have taken an important part, and their armorial bearings which figure in the window will serve as an enduring reminder of the intimate connexion of the Old Ashmolean with prominent members of the medical profession. In his opening address to the recent International Congress on Rheumatism and Hydrology, Sir Farquhar Buzzard described the part played by many Oxford men in promoting the study of hydrology. After alluding to Dr. Walter Bailey in pre-Ashmolean days, he reminded the congress of the work of Dr. Plot, the first keeper of the Old Ashmolean, on mineral springs; of Dr. Wall, the founder of Malvern Spa; of Dr. Daubeny who, studying the chemical composition of the more important springs in the Ashmolean laboratory, became the greatest authority on mineral waters of his day. Hydrologists are properly desirous that the evidence for Dr. Daubeny's results should not be lost, that the apparatus used by him in the 'twenties and 'thirties of last century should be preserved, and in preference in the building in which his researches were carried out, for his laboratory notebooks are still in existence. The collections in the Old Ashmolean include a large number of medical and especially of surgical interest, but space and funds for their adequate display are alike wanting. Since the original appeal was made by Lord Halifax the principle has been adopted of permitting benefactors to earmark their gifts for particular institutions in the University. Thus the geological department has received £25,000 from the Shell Oil Companies, the Ashmolean museum of art has received £10,000 from the Drapers' Company, and the department of physics is promised £60,000 from another source. Meanwhile the sums specially allocated to the museum of the history of science, where a special feature is being made of illustrating the work of Oxford men, are inconsiderable in view of the value of the results that may be obtained. Few universities have had a more honourable connexion in the past with the art and science of medicine; none may have a more promising connexion with clinical studies in the future, if the ideals of the great Nuffield foundation are achieved. It should not be difficult to raise the capital which is still required to staff the Old Ashmolean and cover its working expenses.

ENDOWMENT WITH DISCRETION

IN addition to its full annual report and that of its International Health Division, the Rockefeller Foundation publishes each year a less formal review of its work by its president. Last May Mr. John D. Rockefeller, the founder of the foundation, died at the age of ninety-eight, and Mr. Fosdick takes this opportunity [1] to describe the principles which guided him in the distribution of some 530 million dollars for philanthropic purposes. In the first place Rockefeller did not think that benevolence and wisdom were confined to his generation, and that what seems important to-day will necessarily seem important to-morrow. He would have agreed with Sir Arthur Hobhouse's comment on mediæval foundations that "a nation cannot endure for long the spectacle of large masses of property settled to unalterable uses." As a result, when the foundation was incorporated, the sole purpose stated in its charter was "to promote the well-being of mankind throughout the world," and in 1920 Rockefeller wrote to his trustees revoking any restrictions or limitations which he had made as to specific purposes for which his funds were to be used. This has led the trustees to give the recipients of endowment funds wide discretion in the uses to which they may put them. In the second place Rockefeller did not believe that it was wise to attempt to maintain foundations in perpetuity. "Perpetuity is a pretty long time," he remarked. He therefore authorised his trustees to spend principal as well as income, and the foundation has already spent 87 million dollars of its principal fund. In making endowments the foundation allows the recipients to spend 5 per cent. of the principal each year after the fifth, and to use the whole of the principal at the end of twenty-five years for some purpose reasonably related to the original intention, "having regard to intervening changing conditions." These liberalising provisions represent an attempt to free the future from frozen funds and tired endowments.

In the past the foundation has aimed at carrying out its work on an international plane without considering political boundaries or doctrines, but in recent years this ideal has encountered increasing difficulties. Some fields have had to be abandoned

[1] The Rockefeller Foundation: A Review for 1937. By Raymond B. Fosdick. Pp. 62.

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not because the frontiers have any greater significance than they had a few years ago but because behind them the search for truth has been made impossible. The foundation's work in China has been virtually destroyed in the last six months. It was mostly centred in such institutions as Nankai University in Tientsin, and the University and Agricultural Research Bureau at Nanking. Nankai University was completely destroyed last July, and the institutions in Nanking, where they are not too badly damaged, are serving to-day as army barracks. In addition the field units dealing with education and public health are so completely scattered that it is impossible to locate them. It was no doubt the possibility of such eventualities as these that led Rockefeller to avoid tying his benefactions to rigid and unchangeable purposes.

PNEUMOCONIOSIS AND PULMONARY CANCER

EVIDENCE of association between various irritating substances and primary cancer of the lung has long been sought. In the Schaleberg miners there is a relatively high incidence of both pneumoconiosis and of tumours of the lung and bronchus, but here, and in the Joachimsthal uranium mines, environmental conditions are peculiar and the association cannot be securely held to be evidence of a common origin. In other places various workers have noted from time to time the presence of pulmonary carcinoma in persons suffering from silicosis, but there is no evidence in such data that the incidence of carcinoma is greater than in the general population unexposed to a silica risk. C. S. Anderson and J. H. Dible have attempted to test that point by examining post-mortem material.[1] They sought to ascertain whether, in fact, the lungs of persons dying of a primary carcinoma of the lung have a higher silica content than the lungs of persons dying of other causes. To answer the question they carried out silica estimations upon the whole lung, each being estimated separately, in fifty subjects without cancer of the lung and seventy subjects dying of a primary cancer of the lung. The former group was held to represent "the general run of post-mortem material from two general hospitals in Liverpool"; the latter included nearly all the deaths from primary lung cancers in the same hospitals. The comparative results are suggestive. In the non-carcinomatous lungs the mean silica content (i.e., total silica in grammes) was 0·14 for the right lung, 0·12 for the left, 0·26 for both lungs. The corresponding figures for the carcinomatous lungs were substantially higher—namely, 0·34 for the right lung, 0·26 for the left, and 0·60 for both lungs. This excess was entirely due, however, to the silica content in twelve out of the seventy subjects; after the deduction of this group the remainder gave figures identical with those for the controls. In other words, there was, as would be expected, no evidence of a silica risk in the great majority of the persons dying from a cancer of the lung. On the other hand, roughly 1 in 6 of those persons showed a high—most of them excessively high—silica content of the lungs, and such observations were absent from the control group. Of these twelve subjects seven showed indisputable evidence of silicosis, three had an excess of silica in the lungs and a histological picture of fibrosis with the features of that set up by silica, and two an excess of silica with fibrotic changes which though not typical were compatible with a silicious origin.

These results lead the authors to conclude that in a certain group of cases of pulmonary carcinoma the rôle of the silicosis is an ætiological factor. The absence of silicosis in the control group is evidence against the association being fortuitous, and the authors add that their general post-mortem experience has also given them no evidence of a local unrecognised silicosis in persons dying of other diseases. It may be, however, that the complete absence of silicosis from the control group is attributable merely to the smallness of the number examined. Persons suffering from silicosis do not always die of that condition or from pulmonary carcinoma, and should therefore appear *sometimes* in a control group. The question at issue is really whether they appear there less often than in the carcinoma of the lung group. The authors admit that in industries in which silicosis is a recognised risk, and in which much medical supervision is given, no association with carcinoma has been observed, but their plea that this question should receive specific attention should not be ignored. It might well be the subject of a "follow-down" study into the past history of victims of primary carcinoma of the lung, on the lines suggested by W. Cramer.[2]

[1] *J. Hyg., Camb.* 1938, **38**, 185.

BRITISH ASSOCIATION MEETING AT CAMBRIDGE

THE annual meeting of the British Association will be held this year at Cambridge from August 17th to 24th, and Lord Rayleigh will deliver the presidential address on "Natural Vision and Vision Aided by Science." Subjects of addresses and discussions will include the eyes and brain as factors in visual perception, the mechanism of evolution, sense perception and the evolution of colour and pattern, and the water-supply of London. In consideration of a growing public demand the council are grouping together into a definite series those communications which have a more immediate bearing on the life of the community, and they have also authorised the publication of a review of recent progress in various departments of science (The March of Science, 1931–35, Sir Isaac Pitman, 3*s.* 6*d.*), which is to be the first of a quinquennial series. Applications for membership should be made to the office of the Association at Burlington House, Piccadilly, London, W.1.

OTTO NAEGELI

THE name of Otto Naegeli has for so long been associated with tuberculosis and hæmatology that it will come as a surprise to many that he was only 67 years old when he died last month. He came of distinguished medical stock; his father enjoyed the rare honour of begetting two sons who became professors of medicine, Otto his eldest at Zürich and Oskar his youngest who occupied the chair of dermatology at Berne. At the age of 14 Otto was so enamoured of botany that he would have liked to devote all his life to it, and though his father persuaded him to make medicine his main career, he remained at heart a botanist and published more than twenty articles on botanical subjects. Having qualified in medicine he studied under Monakow and wrote a thesis on cyclopia. Soon afterwards, working at Bonn under Ribbert, he undertook a study which has become classic—the demonstration of tuberculosis in 98 per cent. of the 500 dead bodies in which he sought evidence, however minute, of such an infection. It may be mentioned in passing that last year, in the same institute, Uehlinger and Blangey confirmed Naegeli's findings on material twice as large as his own. Naegeli was quick to grasp the import of his

[2] *Brit. med. J.* April 16th, 1938, p. 829.

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findings and to maintain that the fatal issue of tuberculosis is determined not so much by the primary infection as by the disposition of the person infected. At Berne Naegeli came under Hermann Sahli's influence, and his interest in hæmatology was quickened by an epidemic of typhoid fever which enabled him to demonstrate the diagnostic and prognostic value of the differential leucocyte count and started him writing a text-book on hæmatology which was translated into many languages. In 1912 Naegeli was invited to take charge of the medical polyclinic in Tübingen, where he remained during the war, at the end of which he returned to direct the medical polyclinic at Zürich. His last work on "The Differential Diagnosis in Internal Medicine" was carried through in spite of the tuberculous spondylitis which had overtaken him and which entailed all the discomforts of plaster-of-Paris immobilisation. His many contributions to medicine were recognised by honorary degrees conferred at Edinburgh, Berne, Tübingen, Heidelberg, Geneva, and Athens.

THE INVENTOR OF RHEUMATISM

Guillaume de Baillou was a physician of Paris in the latter half of the sixteenth century, who enjoyed a great and deserved reputation in his lifetime, and whose works on medicine lived on after his death for more than a century. His other writings have long since passed to those shelves which are but rarely explored even by the learned antiquarian, but his tract on rheumatism [1] has lived on and is here presented for our delectation translated from the original Latin by Dr. Ruhmann. It has lived chiefly because Baillou was the first physician who attached the name rheumatism to a group of symptoms which constitute a disease, well known, as he says, to every capable physician, but until his time unnamed and included under the general name of "catarrh." The disease which he thus christened is certainly our acute rheumatic fever, and possibly may have included in his mind some other of the more acute arthritides—for instance gonococcal arthritis—but he draws a sharp line of distinction from gout and the more chronic bone and joint affections. His phraseology is often puzzling to us moderns, but it is clear that rheumatism shaped itself in his mind as a disorder of the blood—he compares it in one passage to a "putrid fever"; and though the doctrine of infection was still three hundred years in the future Baillou saw that the outward manifestations of the disease, the effusions into the joints, the pains, and the low fever on which he lays stress, were the result, as we should now say, of a disordered chemistry of the body fluids. Dr. Ruhmann has struggled successfully with the difficult task of translating Baillou and has added footnotes which help to make the sixteenth-century pathology intelligible to the modern reader. Like all good editors he has an unbounded admiration for his author, and concludes his parting remarks with a quotation from the Danish scientist Troels-Lund to the effect that all human development follows the same spiral path upwards and that the new ideas arrive at the same point as the old but at a higher level.

When we have made some allowance for the somewhat complicated pathology the striking feature of Baillou's tract is its accuracy of description. There is little which can be called mere verbiage, and indeed with some omissions it would still be considered a good clinical lecture. It is interesting to find that after a clear account of the signs and symptoms of the disease he adds that for a real and special knowledge the disease must be studied in the bodies of patients: an early instance of insistence on bedside study. Here and there we seem able to trace the Frenchman through the medium of two translations: "The ignorance of the physician means for the patient a second disease" is surely an epigram in the very style of Paris. On the whole the perusal of the brochure leaves one in substantial agreement with Dr. Ruhmann that we have been listening to one of the great physicians.

[1] Das Rheumabuch des Doctor Ballonius. German edition by Dr. Walter Ruhmann, Berlin. Mittenwald: Theophrastus-verlag Arthur Nemayer. Pp. 70.

UNIVERSITIES OF THE EMPIRE

THERE are now seventy universities in the British Empire, each with characteristic features of its own. Before the year 1914 anyone seeking information about the organisation or personnel of one or other of them could only find it in the official calendar which was then the only authentic source of information. The Universities Bureau which was the outcome of the 1912 congress decided to put this right by compiling a year book of which the issue for 1938 is now before us.[1] In its introductory chapters may be found the history, regulations, and practice of the universities in various parts of the Commonwealth, and each section contains a directory of the officers and members of the staff of the university. It is this information which makes the year book indispensable as a work of reference, for the name index which occupies 80 pages, each of 3 columns, is practically a complete academic record of the British nation, and its arrangement and accuracy leave nothing to be desired. Apart from the innumerable little alterations required to keep the year book up to date, the only new feature in this volume is the report of the executive council of the bureau, which shows that the statement quoted in the preface is no longer true that there was a time when university men took little interest in the affairs of any university except their own. The year book also contains a record of outstanding events which have occurred during the previous academic year.

WE regret to announce the death on April 16th of Mr. JOHN BRIGHT BANISTER, surgeon to Chelsea Hospital for Women, senior obstetric physician to Charing Cross Hospital, and consulting obstetric surgeon to Queen Charlotte's Hospital, and a member of the Central Midwives Board.

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[1] The Yearbook of the Universities of the Empire. 1938. Published for the Universities Bureau of the British Empire by G. Bell and Sons, London. Pp. 1154. 15s.

HEBERDEN LECTURESHIP AND MEDAL.—A bronze medal, known as the Heberden medal, will be awarded annually to a registered medical practitioner by the Heberden Society for the best work in the British Isles on the investigation of the rheumatic diseases. The recipient will be invited to deliver the Heberden lecture which should comprise a review of the work carried out for the award of the medal. The first award will be made in January, 1939, and the referees appointed by the society are Dr. Matthew Ray (president), Dr. C. W. Buckley, and Dr. Mervyn Gordon, F.R.S. Published work should be submitted in the first place to the secretary of the society, Dr. Kenneth Stone, 58, Chesterfield House, Chesterfield-gardens, London, W.1.

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SPECIAL ARTICLES

EPIDEMIC INFLUENZA

THE new green-book on influenza[1] will appeal to clinicians as well as to laboratory workers. It is an up-to-date summary of the developments in the influenza problem which have taken place as a result of the discovery in 1933 that influenza was a virus disease and that it was transmissible to ferrets. The discovery of a susceptible animal opened up methods of investigation which had previously been unavailable and a further and unexpected aid to study was provided when it was demonstrated that the disease could be transferred from ferrets to mice by direct inoculation of virus into the respiratory tract under anæsthesia. Swine and hedgehogs were subsequently shown to be also susceptible. For a time it was believed that the virus obtained from different epidemics was immunologically the same, but it was soon shown by Magill and Francis that there is more than one serological type of virus, though it is probable that the different types are very closely related. From a study of cross-neutralisation experiments with strains of virus of various provenance, vis-à-vis their neutralising antisera, it has been shown by Magill and Francis and others that there are at least three types of the virus, though these are very closely related. Wilson Smith, Andrewes, and Stuart-Harris found that ferrets can be protected by vaccination, if not against massive intranasal installation of virus, at least against infection by ordinary contact. They moreover showed that vaccinated animals and animals recovering from the natural disease contain antiviral neutralising bodies in their sera and this also applied to human beings.

ANIMAL EXPERIMENTS

With these facts established it became urgently desirable to devise a method for immunising human beings and put it to trial. During the 1936–37 outbreak of influenza this experiment was undertaken. The vaccine used consisted of filtered preparations of the lungs of infected mice in which the virus was killed with chloroform. Formolysed vaccines, prepared from cultures in chicken-embryo medium, were also tried. During 1936 and 1937 the vaccines were tested on groups of several hundred human volunteers, mostly young soldiers. In each case the virus was shown to be concerned in the outbreak and adequate uninoculated controls were included in the observations.

Unfortunately no conclusive evidence was obtained of the efficacy of vaccination. The fact that a few of the volunteers contracted to typical influenza, of proven virus ætiology more than 14 days after their vaccination, was disappointing. Possibly the failure of the method was due to the unavoidable premature exposure of the vaccinated men to infection; another possible reason is that at the time of the experiment the existence of more than one serological type of virus was not appreciated. In further experiments it will be desirable to use polyvalent vaccines and to work out the serological relationships of the virus used in the vaccine to the virus isolated from the epidemic against which the vaccine is being tried out.

WHAT IS INFLUENZA?

In addition to the interesting experimental work recorded the report contains a valuable clinical and epidemiological study of the 1936–37 epidemic by Dr. Stuart-Harris in which the natural history of the disease is reviewed, at first hand, in the light of the recent experimental findings. The study of influenza is entering a phase already illustrated by dog distemper, where the immediate result of ætiological discovery has been to show that what was previously classified as a single disease, in reality consists of a number of clinically and epidemiologically separable entities. At this stage in an ætiological investigation clinical and experimental observers should keep very closely in touch with each other. The central clinical question of influenza—"what is influenza and how may the individual case be diagnosed?"—has not been answered, but unquestionably the knowledge that there is a virus influenza—an *influenza vera*—has added definition to the problem even if it has not yet provided a solution. Dr. Stuart-Harris's observations show that influenza-like conditions exist which are almost certainly of a different ætiology from the typical virus disease. He gives these epidemics from which no virus could be isolated the name of "febrile catarrhs." Epidemics of these "febrile catarrhs" may be quite extensive, but it seems probable that the larger epidemics and pandemics of influenza will prove to be the virus disease.

DIFFERENTIAL DIAGNOSIS

Dr. Stuart-Harris makes some interesting observations on differential diagnosis.

The outstanding characters of the *virus disease* are its sudden onset with constitutional symptoms followed later by coryza, sore-throat, and cough. The fever rises rapidly on the second day and may or may not be followed by a remission on the third day, but there is usually a renewed pyrexia on the fourth day (diphasic temperature). The typical facies is heavy and drowsy with drooping eyelids, glistening eyes, dusky facial flush, and slightly cyanosed lips. Bronchiolitis is a common later complication.

In the "*febrile catarrhs*," at least those forms observed by Dr. Stuart-Harris, the onset is insidious, and respiratory symptoms or angina are early. The general symptoms are inclined to be overshadowed by the local symptoms in the respiratory tract. The fever has no characteristic course and shows no special tendency to be diphasic in type. The general aspect is that of a patient with a heavy cold.

The report also contains an account by Mr. D. L. Hughes of an inquiry as to the diagnostic value of blood counts in influenza. No evidence was obtained that either the total or the differential blood count has any diagnostic peculiarity.

A study of a limited number of cases of pneumonia during influenza epidemics suggested that there is a form of true influenzal pneumonia, associated with the presence of the virus in the lungs though sometimes assisted by secondary infections with bacteria. In this, too, the older surmise of clinicians has been confirmed.

SERUM THERAPY

In 1935 Laidlaw, Wilson Smith, Andrewes, and Dunkin described the use of an antiviral horse serum in the treatment of mice experimentally infected with influenza virus. The present report describes some observations as to the therapeutic use of antiviral serum in the treatment of human influenza. In all nine patients were thus treated, some of them suffering from severe influenza. It is interesting to note that all the more severely affected patients seemed to get

[1] A Study of Epidemic Influenza with Special Reference to the 1936–7 Epidemic. By C. H. Stuart-Harris, C. H. Andrewes, and Wilson Smith, with D. K. M. Chalmers, E. G. H. Cowen, and D. L. Hughes. *Spec. Rep. Ser. med. Res. Coun., Lond.* No. 228. London: H.M. Stationery Office. 1938. Pp. 151. 2*s.* 6*d.*

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better temporarily after the injection of serum, but taking the results as a whole it was impossible to show that serum treatment had any unquestionable beneficial effect on the course of the disease. The fact that these initial experiments in both vaccine prophylaxis and serum therapy have been in a measure disappointing gives no grounds for pessimism at this stage. It is quite obvious that in coping with influenza we are only at the beginning of things. Not the least promising line of investigation is that arising from the successful cultivation of the virus in media containing chick-embryo tissue. Recent work by Francis and Magill and also by Hyde and Chapman indicates the possibility that the virus can be isolated from man by employing mice and chicken embryos in place of ferrets, and if this technique proves successful one of the major difficulties in the laboratory diagnosis of the disease will be removed.

VULVO-VAGINITIS IN CHILDREN

(Extracted from a report of a Departmental Committee appointed by Sir FREDERICK MENZIES, *Medical Officer of Health to the County of London*[1])

THE well-known fact that bacterial infection of the genital tract usually begins in the cervix in adults and in the vagina in children depends upon certain interrelated anatomical and physiological differences in the genital tract before and after puberty.[2] In the fœtus and new-born child the vagina is lined by thick many-layered stratified squamous epithelium. In the infant of three to four weeks the epithelium is much less thick, and by two to three months it has become quite thin and remains so until puberty, when it changes abruptly to the florid many-layered type. Glycogen is abundant in the epithelium of the new-born infant and the maiden, but absent or scanty in that of the child. Its presence in the vagina fosters bacterial fermentation, and Döderlein's bacillus, which is able both to ferment glycogen and to resist the high degree of acidity (*p*H 4·0 to 4·4) which ensues, becomes the predominant and usually sole survivor. Thus in the infant for two to three weeks after birth and in the adolescent girl there is a thick smooth vaginal epithelium accompanied by a fair amount of highly acid vaginal "secretion"—factors which inhibit bacterial invasion. Between these two periods the thin vaginal epithelium becomes rugated and cryptic while the absence of fermentable glycogen results in a slightly alkaline, very scanty secretion, so that bacterial infection is facilitated.

These changes almost certainly depend on the presence of the œstrogenic hormone in the circulation. Œstrin is abundant in the new-born child and presumably the fœtus, being derived from the maternal circulation via the placenta, but after the first week it cannot be demonstrated in the urine and remains absent until puberty, when pituitary stimulation causes it to be produced by the child's ovaries. By administration of œstrin the vaginal mucous membrane of the child may be converted from the thin susceptible to the adult resistant type, and this is the basis of œstrin therapy in vulvo-vaginitis.

Classification

The term "vulvo-vaginitis" includes a variety of conditions varying greatly in their clinical manifestations, their causal organism, infectivity, and the readiness with which they yield to treatment. A vaginal discharge is characteristic, but frequently there are only soreness and irritation of the vulva with reddening and perhaps œdema of the vulva and introitus. Frequency of micturition is common and the inguinal glands may be enlarged. For practical purposes it is best to classify the cases as gonococcal or non-gonococcal, since "gonococcal vulvo-vaginitis" is a recognised clinical entity with peculiar problems of its own.

In the last two years a very careful watch for this disease has been maintained among the many thousands of sick and healthy children at the hospitals, residential schools, and nurseries of the London County Council, and during this period there have been 627 cases of vulvo-vaginitis, of which 32 were gonococcal. In a series of 1219 cases at the Hospital for Sick Children, Great Ormond-street, Dr. Nabarro classed 249 cases as gonococcal, 949 as definitely non-gonococcal, and 21 as doubtful, and of 955 cases seen at out-patients between 1930 and 1936, 117 were classed as gonococcal and 838 as non-gonococcal. These series were to a certain extent selected. The Council's proportions of positives was too low because known gonococcal cases are diverted at once to St. Margaret's Hospital, whereas the figures at Great Ormond-street were too high as the hospital has a V.D. clinic to which known cases are naturally sent from other hospitals and child welfare centres. The fact emerges, however, that vulvo-vaginitis is only in a small minority of cases gonococcal, a point which is perhaps not widely appreciated.

No useful purpose is served by emphasising the causal organisms to parents and the public generally. Vulvo-vaginitis in children is only very rarely a venereal disease, and it is really an accident whether the cause is a gonococcus, a streptococcus, a colon bacillus, or any other organism.

Gonococcal Vulvo-vaginitis

This disease causes the gravest anxiety to all responsible for the health of children owing to its great infectivity, resistance to treatment, and the horror it excites in the public mind. Its incidence is very difficult to gauge as it is, of course, not notifiable and there is every motive against publicity when outbreaks occur. The number of cases in children under 14 coming under hospital or clinic treatment in London in 1936 may be estimated as follows:—

St. Margaret's Hospital	32
Hospital for Sick Children, Great Ormond-street	24
London Lock Hospital	14
Children's Medical Home, Waddon	44
V.D. clinics under Public Health Scheme	34
	148

This list inevitably excludes cases treated in private but it does include an unknown number from the Home Counties.

ÆTIOLOGY

Infection is usually the result of contamination of the vulva with such infected fomites as towel,

[1] The members of the committee were: Dr. P. J. WATKIN, medical superintendent, Lambeth L.C.C. Hospital (chairman); Dr. D. KATHLEEN BROWN, medical officer in charge of the V.D. department, South London Hospital for Women; Lieut.-Colonel E. T. BURKE, director, Whitechapel Clinic; Dr. R. CRUICKSHANK, pathologist, group laboratory, North-Western L.C.C. Hospital; Dr. LETITIA D. FAIRFIELD, senior medical officer, London County Council; Dr. G. W. GOODHART, pathologist, group laboratory, St. Mary Abbots L.C.C. Hospital; Dr. R. LIGHTWOOD, assistant physician for children, Westminster Hospital; Dr. D. N. NABARRO, director, pathological department, Hospital for Sick Children, Great Ormond-street; Miss GLADYS M. SANDES, F.R.C.S., hon. surgeon, London Lock Hospital; and Dr. A. GORDON SIGNY, pathologist, Infants Hospital, Vincent-square.

[2] The early paragraphs are taken from Appendix I of the report, by Dr. R. Cruickshank.

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sponge, bed linen, or lavatory seat. The high incidence of infection in the parents of these children points strongly to this mode of transmission, especially in poorer homes where accommodation is inadequate. This fact emphasises the need for impressing adult sufferers from gonorrhœa with the necessity for protecting from infection any children with whom they come in contact. Direct infection by assault is not a common cause in this country. In institutions the infection may be spread by bed-pans, bed-pan covers, lavatory seats, towels, flannels or sponges, nurses' aprons, clinical thermometers, if rectal temperatures are taken, or enema nozzles.

In a series of 471 children (aged 3 to 14 years) admitted to the Children's Medical Home, Waddon, from March, 1928, to December, 1936, the analysis of causes, as given by the medical officers sending the cases, is as shown in Table I.

TABLE I

	Cases and per cent.
Accidental	160 (34·0)
Unknown or doubtful	98 (20·8)
Parental infection	120 (25·5)
Probably parental infection	21 (4·5)
Other contact in house	8 (1·7)
Assault	24 (5·1)
Probably assault	6 (1·3)
Relapsed	22 (4·6)
Ward infection	9 (1·9)
School infection (?)	3 (0·6)

DIAGNOSIS

Usually the inflammation and œdema of the urethral meatus and hymen are very typical and, after careful swabbing of the vulva, a probe passed into the urethra shows pus. The pus spreading back over the perineum may cause a rectal infection. The anus is red and moist and there is sometimes mucus on the fæces. The first rectal test may be negative, but if the vaginal discharge does not clear the tests should be repeated at intervals, otherwise an infection may be missed and there may be reinfection from the rectum later.

Incubation period.—In the great majority of cases the incubation period is three to four days, but in rare instances it may be longer.

Symptoms and signs.—There may be a complaint of vaginal discharge with burning or irritation of the vulva in young children, discomfort on walking, or frequency and pain on micturition. The lack of symptoms is often surprising, particularly in older children, and the mother brings the child to the doctor because the discharge is found on the clothing. In a *chronic case* there is a slight inflammation of the vulva and vagina with usually a scanty discharge which may be thin, purulent, or muco-purulent. The mucous membrane of the vulva is injected, particularly in the deep clefts between hymen and labia minora and just within the urethral meatus. The hymen is frequently torn and stretched. The cervix should be examined in these cases. In an *acute case* the diagnosis can readily be made on clinical signs alone. The vulva is hyperæmic or acutely inflamed, and bathed in pus which oozes from the vagina with any expulsive effort. The pus may be thick or thin, yellow or greenish. It is rarely blood-stained and never so offensive as in the case with foreign bodies in the vagina. In neglected cases there is excoriation of the labia majora, groins, and inner surfaces of thighs, with adherent crusts of dried pus.

Collection of material for bacteriological diagnosis.—Many failures to make a correct diagnosis are due to bacteriologists being supplied with material taken by unsuitable methods or by unskilled workers. Swabs should be taken only by a clinician expert at the task and never delegated to a member of the nursing staff unless she has been specially instructed. Both smears and cultures should be examined wherever possible since (*a*) Gram-negative diplococci other than the gonococcus are occasionally present in the vagina and (*b*) a diagnosis of gonococcal infection on smear alone will not be accepted in any medico-legal proceedings.

At least one assistant is essential to hold the child still in the correct position. The child is placed in the dorsal position with the knees drawn up and the thighs separated as far as possible without hurting the child, the external genitalia being exposed in a good light. Any superficial discharge is removed with wool and the labia separated with the gloved thumb and forefinger of the left hand.

Two *vaginal swabs* are taken with wooden or wire applicators round which a thin layer of good quality sterilised cotton-wool is firmly wrapped. The probe must be passed well into the vagina and withdrawn with some discharge on it. The first swab is used to make a thin even smear on a clean glass slide; the film is allowed to dry in air and is then preferably "fixed" by being passed through a gas or spirit flame several times, after which it is wrapped in paper and placed in the special slide box supplied for the purpose. Smears should never be packed while still moist. The other swab is used for inoculation of the culture medium, which may be done at the bed-side, or the swab may be transported as quickly as possible to the nearest laboratory.[3] Smears and swabs should be taken for culture from the *urethra and rectum* in proved gonococcal cases or in patients suspected of past or present gonococcal infection, or where there is any other special indication.

The complement-fixation test.—Most workers agree that the complement-fixation test is usually negative in the early stages of a gonococcal infection and therefore plays little part in the early diagnosis of vulvo-vaginitis in children. The evidence as to its value in the later stages of infection is still rather conflicting. The test should certainly not be regarded as an alternative to careful examination of films and cultures from the mucous membranes, especially in the early stages of an inflammation. Definite cases of gonococcal vulvo-vaginitis may have a negative complement-fixation test throughout.

Complications.—Cervicitis is one of the common causes of recurrence and it is possible that it is present in the majority of cases in the early stages. The cervix should not be examined as a routine, but only in those cases which relapse or fail to clear up with the usual methods of treatment. Ascending infection through the internal os causing an endometritis salpingitis or pelvic peritonitis occurs rarely, and, although urethritis is so usual, cystitis is also very rare. Gonococcal conjunctivitis and iritis are very uncommon and have never occurred as a complication at the Children's Medical Home, Waddon. In infants vulvo-vaginitis may occur concurrently with gonococcal ophthalmia, though not as a rule during the first few weeks of life. Later, a vaginitis in a child with ophthalmia may be overlooked as the eye condition is more serious and attention is focused on this. Ophthalmia as a secondary complication of gonococcal vulvo-vaginitis is very rare.

Table II shows the complications in 467 cases treated at the Children's Medical Home between 1928 and 1936.

[3] An interval of not more than three hours does not appreciably affect the viability of the gonococcus, provided as much material as possible is taken on the swab and the cotton-wool stopper is plugged tightly, but any period longer than this will render the specimen worthless.

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TABLE II

	Cases and per cent.
Urethritis	377 (80·7)
Proctitis	55 (11·8)
Cervicitis	11 (2·3)
Warts	4 (0·8)
Endometritis and salpingitis	4 (0·8)
Purulent conjunctivitis (G.C. negative)	4 (0·8)
Tenosynovitis	2 (0·4)
Arthritis	1 (0·2)
Infected eye socket	1 (0·2)

TREATMENT

General nursing instructions.—The careful nursing of all children collected in hospitals and institutions is of the highest importance in the *prevention* of vulvo-vaginitis. The following measures are recommended for children with any form of vulvo-vaginitis:

(*a*) Certificated nurses only should be employed in the care of affected children *until* three negative swabs have been obtained in a period of not less than a week, and the condition is considered to be non-gonococcal on clinical grounds. Nurses employed in the care of affected children must not attend to unaffected children.

(*b*) Every affected child should have a separate bed-pan or chamber, unless provision is available for efficient sterilisation of such utensils after use.

(*c*) Special attention should be paid to the clothing of infected children. When the discharge is profuse, a light pad of non-irritating material is advisable, so as to minimise friction. All infected clothing should be soaked in a suitable disinfectant before being sent to the laundry.

General routine.—This should include all procedures likely to help in "building-up" the resistance of the patient and may in certain cases be the most important factor in arresting the infection. In-patient treatment with rest in bed is advisable during the acute stage for 1 to 3 weeks, and thereafter infants should lie and older children play for most of the day on a balcony or in the garden. Organised games, singing, and elementary lessons under a nursery governess help to prevent the dangers of "idle hands," but excessive exercise may be detrimental. The diet should be balanced and include milk, fruit, and fresh vegetables. Ultra-violet light is useful during the winter and for specially debilitated children.

Local treatment.—No packing of the vagina should be carried out and only non-irritating solutions should be employed. The vulva should be swabbed with lotion and dusted with a drying powder as often as necessary to keep it free from pus and as dry as possible. If the discharge is profuse, a Sitz bath may be given as a preliminary to treatment.

1. *Douching.*—Douching may be necessary to remove excessive vaginal discharge and may be employed as a routine. It is carried out with a rubber catheter attached to a douche can or to a Higginson's syringe, using protargol (¼ per cent.), tinct. iodi mitis (℥i to Oi) or Dettol (℥ss to Oi). Alternation of the solutions is advisable every two weeks.

2. *Swabbing.*—Opinion differs as to the value of swabbing or painting the vagina. Protargol (10 per cent.) or Milton (50 per cent.) in glycerin may be applied to the vagina on dressed throat swabs or wooden applicators, or on dressed Playfair's probes in older children.

3. *Urethral treatment.*—Routine swabbing or painting with 5 per cent. protargol or 1 to 2 per cent. silver nitrate is recommended by some when the canal is involved.

4. *Rectal treatment.*—Swabbing if used at all should be restricted to cases in which the rectum has been found to be infected with the gonococcus and carried out with the greatest care.

Special treatment.—(a) *Vaccine therapy* with a reliable stock gonococcal vaccine. Some authorities are definitely opposed to this form of treatment, but it has been recommended in chronic cases where there have been relapses and in the rare cases of tenosynovitis or arthritis. It should never be given during the acute stage.

(b) *Œstrin.*—Many observers have reported favourably on the use of œstrin. Œstrin can be given by mouth, by injection, or in the form of suppositories, the dosage being approximately five times as great by mouth as by injection. The oral method is probably to be preferred as children do not object to it, and the daily insertion of a vaginal suppository is considered undesirable. The daily dose is 3000 to 6000 units, according to the size of the child, and it may be given at one time, say every morning. The character of the discharge, macroscopic and microscopic, should be noted every day. The purulent gonococcal discharge soon gives place to one containing many squamous epithelial cells and Döderlein's bacillus but no gonococci. The duration of the treatment varies from a few weeks to a few months. Relapses may occur after or even during a course of œstrin and are then usually found to be due to a urethral or rectal infection; they usually clear up quickly with œstrin and associated treatment of the urethra or rectum. Unpleasant effects such as engorgement of the breasts, vaginal hæmorrhage, and especially masturbation have been ascribed to the use of œstrin by some observers.

(c) *Sulphanilamide and allied substances* have been used in some cases with encouraging results but it is too early to assess their value fully. Attention is drawn to the very varying degree of efficiency in the preparations of both œstrin and sulphanilamide now on the market. If good results are to be obtained the selection of a reliable preparation is essential.

RELAPSES

The tendency to bacteriological and clinical relapse is one of the features of this disease. These relapses may sometimes be of very short duration and pus may be present only for a few hours, so that a test may be positive on one day and negative when repeated the following day for confirmation. There may be no clinical signs in these latent cases, but the gonococci may be found in apparently clear mucus. Relapses may be due to reinfection from an insufficiently treated urethra, or from the cervix or rectum, but masturbation is a contributory factor. It is the persistence of this habit, after treatment has ceased, which makes a clinical diagnosis of cure very difficult in many cases. Reliance on the bacteriological reports is essential. The influence of bad hygienic conditions at home, of tight and dirty clothing, and of masturbation in prolonging an unhealthy appearance of the genital parts should not be forgotten. From 11 or even 10 years onwards, the physiological changes of puberty may be responsible for intermittent congestion of the parts, moisture, and mild leucorrhœa. None of these conditions should be mistaken for a genuine relapse. It is impossible to arrive at a correct diagnosis in such cases without the examination of films and cultures by an experienced bacteriologist.

It is of importance to remember the possibility of cross-infection and reinfection when considering apparent relapses. Very great care is required to prevent convalescent cases of vulvo-vaginitis in a hospital being reinfected by children still in the acute stage. It may also happen that a child discharged from hospital may be reinfected in her own

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home (perhaps by the original source of infection) and then brought back to hospital with a complaint that she has relapsed.

CRITERIA OF CURE

The intractable character of gonorrhœal vulvo-vaginitis is shown by the long period of treatment and observation required—e.g., up to two years—even when the case is in skilled hands from the beginning. The marked tendency to bacteriological and clinical relapse, the uncertainty of finding the gonococcus in chronic discharges, and the obvious difficulty of proving a negative, lead to the necessity for extreme caution in giving a certificate of cure. But the question of when the child is cured, however controversial, cannot be evaded. Anxious parents must be reassured, schools must be advised when they can safely readmit pupils, and hospitals want to know when they may finally discharge patients. The clinician is required not only to determine whether a child is, at any particular moment, free from infection but also when the liability to relapse has ceased.

It may however be pointed out (1) That there is no direct evidence of gonococcal infection contracted in childhood lasting into adult life. Large numbers of patients who have suffered from gonococcal vulvo-vaginitis have now been followed up for many years and no such case is known. Moreover, the previous history of the thousands of adult patients who have attended the V.D. clinics during the past twenty years has been recorded with care, and no such tendency has been noted. (2) Exacerbations commonly occur in the early stages after treatment has ceased, although rarely after three months.

Criteria of cure should be negative tests (films, cultures, and gonococcal complement fixation) for a minimum of four months after cessation of all treatment. During this time the patient should be under observation at frequent intervals.—Daily inspection of the vulva is advisable for the first three months after suspension of treatment in view of the very short duration of some relapses, but this can be done quite adequately by an intelligent mother after the first few weeks. Normally the vulva clears up completely after treatment but there may sometimes be a persistent redness and slight discharge which is not pathological. After treatment has been discontinued a full set of films and cultures should be made from vagina, urethra, and rectum (if considered advisable). For a minimum of four months vaginal and urethral swabs should be taken at weekly intervals for the first three weeks and subsequently at intervals of two or three weeks. The final set of swabs and cultures should be taken after a provocative dose of vaccine administered 24 hours previously.

The place of the complement-fixation test among the criteria for cure of gonococcal vulvo-vaginitis is still undecided. When performed in a laboratory where such tests are being done weekly on a considerable scale and under well-controlled conditions, as in the Council's laboratories, the test has been helpful. When both the bacteriological and the serological tests are negative, cure may be assumed. When the bacteriological test is negative but the complement-fixation test remains positive for more than six weeks, the persistence of some hidden focus of infection may be suspected, but such persistently positive tests are rare. Change to a negative reaction is sometimes accompanied or followed by a recurrence of the vaginal discharge.

When a period of six months has elapsed after cessation of treatment without obtaining a "positive" result (bacteriological or serological), or definite clinical evidence of vulvo-vaginitis, there can, in the opinion of the committee, be no object in continuing observation of the patient. Such continuous observation will tend to perpetuate anxiety in those responsible for the child, to keep up bad habits if they exist, and to fix in the memory an unfortunate experience.

Non-gonococcal Vulvo-vaginitis

Non-gonococcal vulvo-vaginitis is not uncommon in girls between the ages of 2 and 7. It becomes relatively infrequent after that age and appears to be very rare after the age of 10. The conditions which may give rise to vulvo-vaginitis, or are found in association with it, are of a very diverse character. They are as follows:—

(*a*) *General causes.*—(1) Acute specific infections. It may develop as a prodromal symptom or sequela of the exanthemata or occur during the course of general acute infections, particularly pneumonia. It has also been observed in influenza and possibly in ordinary coryza. (2) General debilitating diseases and the anæmias. (3) Secondary to acute throat infections, most commonly streptococcal, but also in association with diphtheria and Vincent's angina.

(*b*) *Local causes.*—(1) Foreign bodies, such as safety-pins, marbles, or gauze-swabs, in the vagina. (2) Direct infection from fingers of attendants and by towels and clothing or by direct contact with dirt (as in children with inadequate clothing). (3) Secondary to irritation, congestion, or inflammation in adjacent organs—e.g., with threadworms, chronic constipation, appendicitis (acute or chronic), and infection of the renal tract. (4) Direct irritation of the parts by tight clothing or masturbation, which causes a local hyperæmia and predisposes to invasion of organisms.

DIAGNOSIS

Clinical signs.—A differential diagnosis between the various types of vulvo-vaginitis cannot be made without bacteriological tests, but certain clinical signs are highly suggestive. In "diphtheroid infections," for example, there is redness of the vulva and discharge, if present, is scanty. Discharge due to foreign bodies is characteristically blood-stained and offensive; that due to staphylococci is usually thick and creamy, whilst that caused by the streptococcus is thinner and colourless; and *B. coli* may give rise to an offensive discharge with a characteristic odour. The vaginal discharges which occur occasionally at the onset of a general infection may simulate any of these characteristics.

Bacteriological diagnosis.—A large variety of organisms have been found in smears or cultures from vaginal discharge, either singly or in combination. The relative frequency of the infecting organisms varies in different centres. For example, among 71 cases examined at the Hospital for Sick Children, Great Ormond-street, by Dr. Wood, non-hæmolytic streptococci (mostly enterococcus) were recovered from 51, *B. coli* and a typical coliform bacillus from 36, anaerobic Gram-positive cocci, *S. albus*, and diphtheroids from a quarter to half the cases, while the hæmolytic streptococcus was isolated from 10 and *S. aureus* from only 2 patients. In fever hospitals the most frequent causal organism is the hæmolytic streptococcus, most of the infections developing as complications of scarlet fever or tonsillitis. Rarely *C. diphtheriæ* produces a true diphtheria of the vagina although virulent strains may be present in the vagina without producing diphtheritic infection. Other organisms like the pneumococcus, *H. influenzæ*, Gram-negative cocci other than the gonococcus, and the tubercle bacillus

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seem occasionally to be responsible for vulvo-vaginitis. *Trichomonas vaginalis* does not apparently produce infection in the child.

TREATMENT

Attention should be drawn to the very low infectivity of non-gonococcal vulvo-vaginitis. Familial spread is occasionally reported, but an epidemic in schools or hospitals or indeed the infection of any one child by another appears to be very uncommon. The presence of a focus of sepsis (especially of the hæmolytic streptococcus), however, obviously makes any child an undesirable occupant of a ward or dormitory.

Treatment calls for considerable judgment. Many cases are very mild and require little or no treatment except baths and local cleanliness and removal of any causal factor. Indeed the great danger is over-treatment, for prolonged swabbing and douching may not only keep up a vaginitis but actually increase it. Prolonged confinement to bed is very harmful, for it lowers the general health and leads to masturbation. The more severe infections should be treated on the same lines as the gonococcal cases, including œstrin therapy.

In a very small number of children the discharge proves extremely persistent and may fail to clear in twelve months or more. In troublesome infections, a short course of daily irrigations with lotions of iodine or chloramine T. may be given. Any septic focus present should be dealt with—e.g., tonsillectomy, dental extractions, or treatment for pyelitis or cystitis may be required. Convalescence in a suitable environment is invaluable in those cases which will not clear completely or tend to relapse, but it presents practical difficulties. Few, if any, convalescent homes welcome children with a recent history of vulvo-vaginitis whatever the cause!

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The great majority of cases clear completely after 2 to 3 weeks' treatment, but it is advisable to keep the child under observation for 2 to 3 weeks after the discharge has ceased as recurrences are not unknown. In hæmolytic streptococcal infections the tendency to relapse may last for a considerable length of time. In view of the alarm caused by any vaginal discharge, children allowed to return to a residential school or institution should be examined at weekly or fortnightly intervals for two months after their return.

Administrative Aspects

This aspect of the problem is of great importance, for any authority or organisation undertaking the care of children, sick or healthy, is faced with two serious obligations—to protect non-infected children from the possibility of infection with the disease, and to detect, isolate, and treat any case of vulvo-vaginitis occurring in a child for whom it is responsible. For the protection of sick children, the committee have suggested certain instructions (see below) which have, with slight variations, been in operation in the London County Council's hospitals for over two years, and during this time there has been no spread of the disease. The plan of swabbing all female children on admission to hospital was rejected because with such a large number of child patients the procedure would be burdensome and would in no way obviate the necessity for other precautions.

As regards healthy children in the Council's residential schools and receiving homes, the staffs are asked to maintain a careful look-out for any sign or symptom of the disease. The children's underclothing and bed linen are watched for evidence of discharge, and any child considered suspicious is at once isolated and swabbed.

At these establishments the isolation of a suspicious case presents greater difficulty than in a hospital. Many institutions have little or no provision for the accommodation of potentially dangerous material, and the staff are naturally anxious to transfer any "suspicious" child as soon as possible. It has been found, however, that if too free encouragement is given to the transfer of girls to hospital children may be sent into hospitals quite unnecessarily, for conditions which are mere physiological incidents in development, or for transient and quite unimportant redness of the parts. Moreover, once a diagnosis of vulvo-vaginitis has been made, the child is marked out and her record is regarded with suspicion. If, however, definite clinical evidence of vulvo-vaginitis is present, an institution should not be expected to keep a child until bacteriological tests have been made and in no case should they be asked to keep a child who needs treatment.

Precautions for Healthy Children

(1) *Detection.*—The vulva and anal region of every female child under the age of fourteen must be inspected on admission, and a note of the condition entered on the case paper. Subsequent to admission a careful look-out should be kept for vaginal discharge.

(2) *Isolation.*—If a discharge is found, the child must be immediately isolated from all other unaffected female children, and a bacteriological examination made. The child may be barrier nursed in an adult female ward.

(3) *Contacts*—i.e., all the female children in the ward *unit* in which the suspected case has occurred—must be examined clinically without delay. Bacteriological examination should be made only if there is any evidence of vulvo-vaginitis, in which case the child must be isolated. The clinical examination of contacts must be repeated daily until the bacteriological examination of the original suspected case is completed. If the original case proves to be non-gonorrhœal, systematic clinical examination can be discontinued; if it proves to be gonorrhœal a bacteriological examination of the contacts must be made at once and the clinical examination continued daily. The bacteriological examination must be repeated if any further case develops, and a final bacteriological examination of all the contacts must be made eight days after the last case has been discovered in the ward.

(4) *Quarantine.*—Immediately there is a suspected case in a ward all admissions to and discharges from the ward must cease until either the case is proved to be non-gonorrhœal or the ward has been free of infection for ten days.

(5) *Nursing of non-affected children.*—The following nursing points apply to *all* female children:—

(i) The nurse must thoroughly wash her hands after attending to the toilet of the child. Rubber gloves may engender a false sense of security and so lead to neglect of washing.

(ii) The nurse's overall or apron may carry infection especially when she puts the child on her lap. It must be protected by a square of mackintosh, a separate one being reserved for each child. The mackintosh must be thoroughly cleansed with an antiseptic before and after use. Towels used for any child must be reserved for that child alone and should be thoroughly dried after use.

(iii) Each child should have a separate thermometer. If this is not possible, the patient's temperature should be taken either in the axilla or the mouth.

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(iv) W.C.s, bed-pans, and chambers should be regarded as possible sources of infection, more particularly those with high seats which involve climbing, and should be thoroughly cleansed with a suitable antiseptic.

(v) No infant or child should, in any circumstances, be allowed upon another's cot.

UNITED STATES OF AMERICA

(FROM OUR OWN CORRESPONDENTS)

A CHALLENGE TO THE A.M.A.

AN unmistakable challenge to the present leadership of the American Medical Association was uttered in the presidential address of Prof. James H. Means to the American College of Physicians meeting yesterday (April 6th) in New York City. "The behaviour of the Association," Prof. Means said, "is political. It is partisan behaviour. It champions a cause. At the present time the cause is something close to standpatism." But the policy could be changed at any time, if the membership willed it. At present the electorate of the Association was apathetic and inarticulate because it had no issues, no platforms set up to vote for. "It is allowing the medical politicians to run things about as they please, and official spokesmen, like Jove on high Olympus, to hurl their thunderbolts of wrath at all who differ with orthodox doctrine." There was need of "medical statesmen, men of intellectual honesty, breadth of vision, courage, nobility of purpose, and the qualities of leadership, who can find the way to the solution of some of the problems of medical service which now baffle both the profession and the public." The development of enlightened opposition within the democracy of the national association was one way of bringing to light such leaders. There was no place for "yes-men" in a truly learned society, nor was there place for political manœuvring, or reprisal for the expression of honest opinion.

Among the orthodox concepts Prof. Means attacked were the "sacrosant doctor-patient relationship," the attitude of organised medicine toward group practice, the question of a third party determining the physician's fee, and the free treatment of the indigent patient.

"We hear a great deal," he said, "about the sacrosant doctor-patient relationship. No third party can be allowed to come between the two involved. This has been used as an argument against all attempts to improve the efficiency of medical service through group practice. When it is suggested that a disinterested outside person could with greater equity than the doctor determine what might be a proper fee for services rendered in any given case, there are storms of protest from the conservative wing of the profession. Yet a philosopher might recognise such an arrangement as an ideal one, and, as a matter of fact, it is actually working successfully in more than one place. . . . I submit that having a third party determine the size of and even collect the fee from the patient for the doctor is not only not an intrusion into the holy doctor-patient relationship, but actually increases the likelihood of the patient's receiving from the doctor the best and wisest treatment the doctor is capable of giving."

Another thing that stimulated the doctor to do his best by his patient was to have his work overseen by his critical colleagues. If this was an intrusion into the holy relationship, then it was to the patient's best interest to have an intrusion. The place where a patient was most likely to have his case diagnosed and treated correctly was in the public wards of a teaching clinic. This was not because the doctors are necessarily any wiser there, but because if one made a mistake another would observe and correct it. If one had some new information about diagnosis or treatment that applied to a given case, he would tell his colleagues about it.

Turning finally to the question whether physicians and surgeons should give their professional services to the care of the indigent, Prof. Means said it must be admitted that if the profession abandoned its traditional custom of giving its service freely to the poor, something of an intangible or spiritual nature would be lost.

"However, we have to face the realities of our own day, and it is not unlikely that in many instances at least the indigent will get better medical service if the community pays for it. It may be proper to add that even if the doctor is paid for caring for the indigent, he still has the opportunity to exercise his generosity, as does any other citizen, by giving of his substance to the most that he is able to the worthy causes of his community. Let him show the world that the doctor can be as good a citizen as any. Let him also, in rendering the service for which he is paid, add to it those qualities of spirit and purpose which cannot be bought with gold. Therein lies his chance to preserve the ancient values in the face of modern adaptations."

Unorthodox views had been expressed on April 4th, the first day of the conference, by Prof. John P. Peters of Yale University, who is the secretary of the committee of physicians which propounded a year ago certain Principles and Proposals now become famous, or infamous, according to the points of view of the 770 signators or of Dr. Fishbein (editor of the *Journal of the American Medical Association*), and the trustees of the A.M.A. Without referring directly to these principles and proposals Dr. Peters said that at present most of the advances in medicine which the rich enjoyed were developed in hospitals and institutions through the instrumentality of the indigent patients. The fees which the rich paid, however, did not as a rule return to the support of these institutions or the patients, but went to the practitioner who was exploiting the medical discoveries. It was his impression that government alone could assume the burden of providing, maintaining, and correlating the necessary medical resources.

"Such a suggestion immediately arouses cries of bureaucracy and corruption, as if these were inevitable attributes of our political system. The medical profession should be the first to deny such allegations. It is its proud boast that the public health services of this country have been free from corruption and politics. But, in any case, there is no good reason to believe that government direction would be worse than the whims and vagaries of philanthropists or the publicists and promoters who have the disposition of large funded fortunes. Nor are the subsidies from the manufacturers of proprietary foods, drugs, and medical instruments likely to direct education, investigation, and practice into the most desirable channels. It is my opinion, further, that cost must eventually be collected by general taxation. Those who can pay for their own care and prefer to patronise physicians of their own choice should not escape the general tax on this account; because this will not be imposed to pay for personal services but for the productive work that makes these services valuable."

Already the word "revolt" has reappeared in the headlines. It is perhaps better justified on this occasion than it was at the time of the publication of the Principles and Proposals. But it must be

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correctly interpreted. The revolt is not a movement to found a new organisation or a new system of government. The dissident group considers that it has had undue difficulty in securing a hearing for its proposals and has been treated with intolerance, and it asks that the American Medical Association should be made "safe for democracy."

To-day (April 7th) the newly installed president of the College of Physicians, Dr. William J. Kerr, indicates that he endorses the position of his predecessor. On the other hand, in Chicago, Dr. Fishbein has told the Associated Press that Prof. Means is typical of those who stand outside and criticise without themselves putting a shoulder to the wheel to help, and adds that "his ignorance of what is going on is actually lamentable." Dr. Fishbein has also rebuked *News-Week* for reporting that the number of signators to "principles and proposals" has grown to 770. The report, however, is correct. The sponsoring committee has also been enlarged and now consists of the following: Russell L. Cecil (New York), Hugh Cabot (Rochester), Milton C. Winternitz, John P. Peters, and George Blumer (New Haven), Alan M. Butler (Boston), Louis Casamajor (New York), Thomas B. Cooley (Detroit), J. Rosslyn Earp (Albany), Channing Frothingham (Boston), L. Emmett Holt (Baltimore), William S. Ladd (New York), William S. McCann (Rochester), George R. Minot (Boston), Hugh J. Morgan (Nashville), Robert B. Osgood and Richard M. Smith (Boston), John H. Stokes (Philadelphia), Borden S. Veeder (St. Louis), James J. Waring (Denver), Soma Weiss (Boston), and William J. Kerr (San Francisco).

AUSTRALASIA

(FROM OUR OWN CORRESPONDENT)

THE STATE AND THE MEDICAL PROFESSION IN QUEENSLAND

CHANGES in the social structure of the community are everywhere being reflected in similar changes in the relation between the medical profession and the public. Queensland, like many other countries, is faced with the problem of adjusting this relationship.

The State government tends towards a hospitalisation programme, and in endeavouring to counter this tendency the Queensland branch of the British Medical Association has been urging a scheme of its own. In September, 1935, it published proposals for a national medical service for the State, based on the provision of a general practitioner for every family. The Association proposed that this should be financed by contributions through the friendly societies, and by government subsidy for unemployed and chronic invalids. The aim was to build the existing system of private practice and the friendly societies' medical service into a national medical service. The Association was opposed to full-time nationalisation and was emphatic that the patient's right of free choice of a doctor should be preserved. The Minister for Health's comment in 1935 was that the scheme was vague and indefinite, that it had not been supported by actuarial evidence, and that the Government would not commit itself without obtaining the fullest information. In the following February the British Medical Association asked for a joint committee to examine the policy for a general medical service, but the Minister replied that the Association should formulate a definite plan showing exactly what contributions would be required from the public, and what benefits contributors would receive. For two years no further progress was made.

The Commonwealth Government is now seriously considering a national insurance scheme which will include all States, and in this it has the support, in principle, of the federal council of the British Medical Association. The position in Queensland, however, has been further complicated by the appearance in the daily press on Jan. 12th of an "open letter" to medical men from the director-general of health and medical services. This "open letter" purported to be a request for coöperation with the Queensland Government, and shortly after its publication a questionnaire was sent to all practitioners in Queensland, in which they were asked to signify whether they were willing, if called upon, to enrol with the Department of Health, for various types of hospital, insurance, or preventive medical work, on a full-time or a part-time basis. As the Queensland branch of the British Medical Association had been complaining for some time that it had been unable to make contact with the Department of Health, much less coöperate with it, the appeal from the director-general was greeted with surprise. It is taken to mean that the Government proposes shortly to extend its activities to the provision of public medical services.

Two possibilities may be inferred from the letter—either that the Government would retain a limited number of doctors who would be wholly paid from public funds, or that a large number of doctors would be paid to devote part of their time to public medical service. It is not known to what extent any such scheme would be affected by the federal insurance plans. Presumably they would bear a portion of the cost of such a scheme. By the time the Commonwealth proposals can be put into effect the Queensland scheme would, it may be supposed, be well developed.

The letter refers to the increased demand by the poorer sections of the community for medical care, for which, under existing conditions, they are incapable of paying, and states that, without true coöperation and the establishment of a proper compromise, the problem as to how both curative and preventive needs can be met for people on the lower income ranges will grow continually more serious. "When it becomes sufficiently acute, it is obvious that the Government will intervene, and it will take its action in terms of the great masses of the population who require the service, irrespective, also, of whether its action interferes with the personal relation between medical men and the patient or does not."

Members of the Queensland branch have been advised by the branch council that they might reply in the affirmative to all the questions in the circular letter, with the proviso added: "the acceptance is subject to the qualification that the conditions of service are satisfactory, and have the approval of the branch." It is felt by practitioners in Queensland that no helpful advance has been gained by means of this step of the director-general, for the Government still is not committed to any future in particular. A frank discussion between the department and accredited representatives of the profession would have been a much more fruitful method of exploring possibilities for future coöperation.

AUSTRALASIAN COLLEGE OF PHYSICIANS

The legal incorporation of the Australasian College of Physicians will soon be completed. The college, it will be recalled, is a development from the Association of Physicians of Australia, a private society

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with restricted membership, but one which was conducted with enthusiasm. The headquarters will be situated in Sydney, and a property has been acquired in Macquarie-street in the medical quarter of the city. The building is to be chiefly a New South Wales responsibility, and moneys from other States will be devoted to an endowment fund, which, augmented by dues from members, will be used to defray working expenses, to found scholarships for medical research, and to establish and maintain a library.

The college will be an examining body, and will provide a uniform higher qualification in medicine for practitioners in Australia and New Zealand. At present the requirements for doctorates in medicine in the universities of Australia and New Zealand are by no means uniform, and there seems to be little chance of obtaining uniformity. With the time not far distant when every member of the staff of a large hospital will be required to have a higher qualification in the special branch of medicine that he proposes to practise, it is anticipated that the college will not only act as a stimulus for the attainment of higher degrees, but will indirectly raise the standard of the practice of internal medicine.

LEGISLATION AGAINST FEE-SPLITTING

A Bill lately passed by the Legislative Assembly of Victoria makes it illegal for a medical practitioner to present an inclusive account for services rendered by himself and other doctors. There have been public complaints about the practice of issuing composite accounts and the sharing of fees, and the Medical Board of Victoria requested that action be taken to put an end to a method so open to abuse. Practitioners are now to be prohibited from demanding payment, presenting an account, or collecting fees for professional services rendered by any other medical practitioner, unless he be a partner, an assistant in his sole employment, or locum tenens. In order to prevent the defence being raised that doctors are carrying on their profession in partnership, all partnership agreements must be approved and registered by the Medical Board. The penalty is a fine of not more than £50 for the first offence, and a fine of not less than £50 and not more than £100 for a subsequent offence. Furthermore, a convicted doctor would be liable to be dealt with by the Medical Board for infamous conduct in a professional respect—the penalty for which may be deregistration.

At first the Victorian branch of the British Medical Association maintained that the Bill was unnecessary, and that its effect would probably prejudice confidence between doctor and patient. Later, while expressing regret at not having been given an opportunity to consider the details before its enactment, the branch meeting approved of the Bill and communicated their approval to the Government.

GRAINS AND SCRUPLES

Under this heading appear week by week the unfettered thoughts of doctors in various occupations. Each contributor is responsible for the section for a month; his name can be seen later in the half-yearly index

FROM A CONSULTING PHYSICIAN

IV

I HAVE always been interested in the application of the principles of biology and evolution to the arts and crafts. To a considerable extent the art of an age is representative of its mental attitude. This is well seen in architecture, though here the manifestations are also controlled by the technical skill and financial resources available. Note the flamboyance of Elizabethan romanticism gradually sobering down to the restrained dignity of the Georgian age of reason. With the earthquake of the French Revolution comes an outburst of individualism in architecture; no one style predominates. As industrialism advances massive buildings of the Babylonian and Egyptian styles appear—slave architecture, as it has been significantly called. Finally with more complete mechanisation comes factory architecture even for private dwellings and academic buildings.

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Every great epoch in art runs its course in an astonishingly short time. First the development of the form and technique, then the full-blown flower, and then its decay in baroque extravagance. It is only necessary to mention the so-called Throne of Aphrodite, now in the Baths of Diocletian, the Hermes at Olympia, and the Laocoon in the Vatican to show that exactly the same sequence occurred in Greek sculpture. Spring, summer, and autumn follow as inevitably as in the seasons of the year. In very little more than fifty years from Marlowe's Tamburlaine the Elizabethan drama had blossomed, flourished, and declined.

There is another biological law which is in apparent contradiction with this. Once life has started it inevitably runs its courses—true; but in lowly organisms we meet with a phase of suspended animation. When conditions are unfavourable, there is a phase of encystment, which may be indefinitely prolonged, and emergence from which is followed by an active phase of rejuvenescence. I find in Byzantine art the parallel to this stage of suspended animation, since for about a thousand years it persisted with only minor alterations. To-day we are realising how much Byzantine mosaic and enamel owes to Persian art blending with what remained of the Greek. A revenge for Marathon indeed. But with the sack of Constantinople in 1204 and its final fall in 1453 the encysted life took on a fresh growth in its new environment. Byzantine art could remain static, but Italy in the fifteenth and sixteenth centuries was changing rapidly. The Sienese school tried to remain static but it became as deliberately out of touch with the art of its time as our pre-Raphaelites were with that of theirs.

* * *

Florentine and Umbrian painting never tried to stand still. It was eager and experimental. The Renaissance enormously stimulated an interest in the classics, and mythological subjects largely replaced sacred ones. The old gods came to life once more and inspired some of Botticelli's most beautiful pictures. Even in sacred pictures the note changed; the emphasis was different. You can trace it in the pictures of the Madonna. The early pictures follow the stiff hieratic Byzantine tradition and the next lay stress on the virginity; but now the emphasis was laid on the maternity. This, they seem to say,

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is akin to the miracle that may happen in any home. Compare Raphael's Madonnas with Lippo Lippi's if you doubt this. Raphael fixed the style and his followers killed it. If we find him conventional, we must remember that it was he who created the convention.

* * *

Whether the Crusaders' sack of Constantinople initiated the rise of Italian painting or no, the sack of Rome in 1527 by the troops of Charles V indubitably ended it. Only in remote Venice did it linger on. Titian, Palma Vecchio, and Gorgione started there together and it is usually thought that the last named was the dominant influence that formed their distinctive style. But Gorgione died young, while Titian continued to paint until his hundredth year. After Titian Venetian art still continued, though it gradually changed its form as Venice came to be the Monte Carlo of its day. But in the rest of Italy art died with Michael Angelo, who indeed was the father of the baroque. The Eclectic Schools of Rome and Bologna adopted the method of compilation. They selected the colour of one master, the design of another, and the technique of a third, expecting in this way to resume the excellencies of all. Unfortunately they left out the essential ingredient—the genius that inspired each.

* * *

How brief was the great period! When Botticelli was born in 1447 Fra Angelico was still painting; when he died in 1510 Raphael and Titian were established masters. Indeed, except for the earlier group of primitives, his 63 years of life overlapped those of all the great masters of Italian painting. In the retrospect it is quite easy to detect the period of decadence. Whether the present chaotic state of the arts is believed to mark the end of an epoch or the dawn of a new one depends on the temperament, and (as I hinted in my first article) on the age of the individual. Nevertheless I would suggest that as history records periods of artistic decadence, I may be right in my feeling that we are passing through such a one now. Yet however much my æsthetic susceptibilities may be outraged by the art of to-day, I am willing to hope that out of the present chaos a new art may still be born. The horizon of man's mind has widened enormously, not only by the material achievements of science but also by the stimulus it is affording to his imagination. After all, hope is of things as yet unseen.

PARLIAMENTARY INTELLIGENCE

WAR PENSIONS

IN the House of Commons on April 14th Mr. SIMPSON raised the question of pension allowance or non-allowance to disabled ex-Service men and their dependents. He asked for less rigidity, a broader outlook and a wider understanding of the duties of the Minister. Complaint was made of the meagre results and the mostly unfavourable verdicts when cases were brought to the notice of the Department. The Ministry needed more rope and less red tape. All kinds of experts and specialists were readily employed and quoted, but unfortunately these seemed more interested in economy and the fine adherence to schedules than in any broad approach to the involved human needs of the applicants. The investigations of the British Legion revealed that there were at least 95,000 ex-Service men who were unable to work through incapacity and who were in need of assistance. He urged the Government to set up a select committee to sift the evidence, to consider proposals and to listen to the insistent voice of criticism.—Sir HENRY MORRIS-JONES said that the duties of the Minister of Pensions were much more difficult now than 10 or 15 years ago on account of the vagueness of many of the complaints submitted. But medical men were most discouraged by the very great difficulty they experienced in getting a medical review of cases where they knew there was real hardship. Medical science had changed tremendously in the last 20 years—there was a different point of view in regard to matters of the heart and chest, for example. Could the Minister not set up a medical committee to secure a review of the various aspects of the medical complaints?—Mr. RAMSBOTHAM, Minister of Pensions, said he was prohibited from granting an entitlement to pension unless he received a medical certificate. The House would never expect him to press his advisers for medical certificates that might not represent their honest view of the case. It was not possible to grant war pensions on a mere possibility, but they could and did award them on a reasonable probability. Our expenditure on war pensions worked out at £53 per annum per disabled man, while in Germany the expenditure was £42 and in France £36. On the point raised by Sir H. Morris-Jones he had had no complaints in the past 12 months.—Sir H. Morris-Jones asked if that were not an indication of hopeless despair.—Mr. Ramsbotham said he did not think that was quite fair. The hon. Member should be aware that there was a system of independent medical experts of the highest repute selected from a panel of the Royal College of Physicians and the Royal College of Surgeons of whom he was making constant use. It was true that the administration of pensions was becoming more difficult. They were becoming concerned more and more with individual cases and less and less with general principles and policy. The reason was that the average age of ex-Service men to-day was about 50, an age at which men were subject to the various ailments resulting from the wear and tear of ordinary civilian life, such as heart trouble, rheumatism, and chest trouble, which were in exactly the same proportions among people in civilian occupations being dealt with by the approved societies. The Ministry endeavoured to give every opportunity to a man suffering from disabilities which he thought were due to war service to establish his case. They made researches for him with the approved societies, with the chemists' shops, with the employers in every direction where there was evidence to show that his complaint had a continuous history. In many cases those links could not be discovered and there was a long lapse between the war injuries and present ailments. A medical adviser could not then conscientiously say that the disability was the result of an injury suffered in the Great War. Unless that system was followed the sooner they abandoned a system of war pensions and called it something else the better.

NOTES ON CURRENT TOPICS

Foot-and-mouth Disease

In the House of Lords on April 12th Lord NUNBURNHOLME called attention to the recent outbreaks of foot-and-mouth disease and asked the Government if they had considered the question of taking further measures to limit transport and access from one parish to another in infected areas.—The Earl of FEVERSHAM, Parliamentary Secretary to the Ministry of Agriculture, said that the type of the disease in the present epidemic differed from that of last autumn and winter in taking a longer time to show its presence in the animal. In the last epidemic

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outbreaks appeared simultaneously over many parts of the country without warning and without evidence of definite centres from which it was spread, and this led them to connect that epidemic with the migration of birds from the Continent which was going on at that time. In the present case the evidence suggested that the infection was picked up at certain important markets in the Midlands which distributed stock over the greater part of the country. In view of the danger of one of the worst outbreaks that this country had ever known and to obtain a breathing space to allow every animal which might have been exposed to infection to be tracked down the Ministry decided on April 4th to impose a stand-still order on the whole of England with the exception of certain counties in the far North and West. Since the imposition of this order five new centres of disease had appeared, but there were indications that the actual spread of infection would not prove to be so serious as at first was anticipated. The measures taken had well stood the test of experience over a number of years. In some countries on the Continent more severe restrictions had been imposed. Churches and cinemas had been closed and football matches prohibited, but he was not aware that such measures had had any great effect. On the Continent the slaughter policy which we could adopt because we lived on an island was not practicable. That meant that infection was not wiped out as it was here and the manufacture of the virus went on unchecked. In those circumstances it was hardly surprising that even more severe restrictions on movement should be advocated. He would point out that while they might close down their parish life they could not close down the life of the birds, ground game, and rodents and other vermin.—Viscount DAWSON OF PENN asked what was the evidence that birds were associated with this infection; and whether there was any particular bird which was thought to be guilty in this respect.—The Earl of FEVERSHAM said the outbreak in the autumn and winter was thought to be connected with the migratory birds which first landed on the East Coast and in the course of their usual flight went westward. It was thought that in particular the starlings might be the means of carrying the virus, but there was no conclusive proof. In the present outbreak, however, there was no evidence to show that spread was due to the flight of migratory birds more than to the movements of any ruminating animal.

On April 12th in the House of Lords the Royal Assent was given to the Middlesex Hospital Act.

The House of Lords rose on April 14th for the Easter recess until May 2nd and the House of Commons adjourned on the same day until April 26th.

QUESTION TIME

TUESDAY, APRIL 12TH

Blind Apprentices

Mr. MATHERS asked the Secretary of State for Scotland whether his attention had been drawn to a complaint made by the National League of the Blind against the action of the managing committee of the Edinburgh Royal Blind Asylum in entering into arrangements for the training of sighted apprentices; and whether he would represent to the institution in question that money voted for the blind should not be expended in the training of sighted persons, especially in view of the fact that when the training was completed there was no guarantee that the trainees would remain in the institution as instructors. —Mr. ELLIOT replied: Sighted workers are employed in the basket-making department of the Edinburgh Royal Blind Asylum, as in other institutions, to instruct or supervise the blind workers, and to do certain work, especially the fine work, which is unsuitable for the blind. I am informed that the directors of the asylum were unable to obtain trained sighted basket workers to replace those about to retire, and that they decided to take on not more than three sighted apprentices to be trained in basket making. The expenditure on this arrangement is met entirely from the voluntary funds over which I have no control. No part of the Government grant is utilised for the training of sighted apprentices.

Voluntary Hospitals and Air-raid Precautions

Mr. LOUIS SMITH asked the Home Secretary whether his attention had been called to the cost which would fall on voluntary hospitals if they took, as they were expected to do, the fullest measures of air-raid precautions to protect their patients and staff; whether he would make inquiries as to the views of hospital managements generally on this important issue; and whether he would then consider the grant to the hospitals of State assistance to ensure the necessary protection.—Mr. GEOFFREY LLOYD, Under-Secretary, Home Office, replied: Voluntary hospitals, like other institutions, are expected to take such measures as are reasonable in the circumstances for the protection of their patients and staff. There will, however, be some hospitals which will be used as casualty clearing stations under a local authority's scheme approved by the Secretary of State; in such cases the local authority could contribute to any special expenditure involved in their use and such expenditure, if approved, would in proper cases rank for grant under the Act.

Milk Pasteurisation

Captain ELLISTON asked the Minister of Health whether he would direct the attention of local authorities to the report of his department on the milk-borne outbreak of food poisoning involving over 100 persons at Wilton, in Wiltshire, and especially to the statement of the chief medical officer that this was an example of the class of outbreak which was due to infection of the milk by a diseased cow; that a clean raw milk was not necessarily a safe milk; and that the only practicable way to reduce the risk of such outbreaks to a minimum was by efficient pasteurisation or by some other suitable form of heat treatment.—Sir KINGSLEY WOOD replied: Copies of the report have been sent to the medical officers of health of all counties and county boroughs.

WEDNESDAY, APRIL 13TH

Insulin Treatment of Schizophrenia

Mr. RHYS DAVIES asked the Minister of Health whether he would place in the Library of the House a copy of the report of the international conference on the insulin treatment of schizophrenia; in what public and mental hospitals in this country that treatment had been applied and with what results; whether any steps were being taken to train a sufficient number of medical men and mental nurses in the technique of this treatment; and whether the treatment was in vogue in any private mental hospitals and, if so, what were the results in those cases.—Sir KINGSLEY WOOD replied: I will endeavour to arrange for a copy of the report to be made available. Insulin treatment is being applied in at least twelve public mental hospitals and six private institutions in this country. It is not practicable within the limits of an oral answer to deal with the questions raised in regard to results of treatment and training in the technique; but on these points I will communicate with the hon. Member.

Ex-Service Men in Mental Hospitals

Mr. KELLY asked the Minister of Pensions the number of ex-Service men who were under treatment in mental hospitals during 1937; and how many of these patients were discharged during the same year.—Mr. H. RAMSBOTHAM replied: The total number of officers, nurses, and men of other ranks for whose treatment in mental institutions my department was responsible during the year 1937 was 6015. During this period 175 cases were admitted, 136 were discharged and there were 152 deaths.

THURSDAY, APRIL 14TH

Closing of Children's School Camp

Sir WILLIAM JENKINS asked the Minister of Labour whether any steps were being taken by the Commissioner for Special Areas to close the school camp at Pembrey, where 350 children from distressed areas were taken fortnightly for health purposes; if so, for what purpose;

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and was he making any arrangement for them in any other place to meet the needs of affected children.—Mr. ERNEST BROWN replied: The site of the school camp at Pembrey has been acquired by the War Office for defence purposes, and as a consequence the school camp is being closed not later than the end of June. In view of the short time available, it has not been possible to make arrangements for the provision of another camp to provide for the children who would, in the normal course, have been sent to Pembrey during the remainder of the season.

More Factory Inspectors

Mr. RHYS DAVIES asked the Home Secretary whether he could give the House any information as to the results of his promised review of the strength of the factory inspectorate.—Mr. GEOFFREY LLOYD, Under-Secretary, Home Office, replied: Yes, Sir. In view of the passing of the Factories Act of last session and of other developments, a scheme has been sanctioned which will have the effect of increasing the strength of the Inspectorate by 62 or about 23 per cent. over a period of three years. The scheme includes the appointment of an additional deputy chief inspector, and an additional superintending inspector to take charge of a new division which is being created in the Midlands, and the addition of three medical, one electrical and seven engineering inspectors. Some of the additional staff have already been recruited and further competitions are now being announced. It is difficult to forecast the effects of the new Act on the work of the department, and the scheme is subject to review in the light of experience.

Medical Men and Air-raid Duties

Mr. BULL asked the Home Secretary in what manner the services of doctors were being enlisted for duty in connexion with air-raids; and whether those who had offered their services for this work had been allocated to specific districts.—Mr. GEOFFREY LLOYD replied: Doctors will be required in connexion with air-raid precautions primarily for supplementing hospital staffs, and my right hon. friend is in consultation with the Minister of Health on the whole question of hospital provision. In the meantime the scheme for the training of doctors in anti-gas measures is proceeding steadily.

Removal of Hospital Patients from Vulnerable Areas

Mr. SANDYS asked the Home Secretary whether it was proposed to send a proportion of hospital patients from the more vulnerable areas to other parts of the country; and, if so, what arrangements had been made in the case of London.—Mr. GEOFFREY LLOYD replied: This is one of the matters in connexion with hospitals generally about which my right hon. friend is in consultation with the Minister of Health.—Mr. SANDYS: Have no arrangements yet been made in London?—Mr. LLOYD: We hope the survey of London will be completed in the next few weeks.—Mr. J. GRIFFITHS: Is the hon. gentleman aware that hospital accommodation in provincial towns is already overtaxed, and that if anything is to be done in this matter serious attention should be given to that fact?

Experiments in Prison Reform

Mr. GALLACHER asked the Secretary of State for Scotland if his attention had been drawn to the experiments in prison reform now being operated in certain English prisons; and if he would take steps to initiate similar experiments in Scottish prisons.—Mr. ELLIOT replied: As regards the first part of the question the reply is in the affirmative. Many improvements in Scottish prison conditions have been made in recent years and others are either in process of being introduced or are now being planned. The reclassification of prisoners, which is an essential preliminary to many of these improvements, was begun on April 1st and is now actively in progress. The desirability of assimilating the conditions in Scotland and England as far as possible is constantly borne in mind.

Tuberculosis Eradication in Herds

Mr. ROBERT GIBSON asked the Minister of Agriculture what counties in England and Wales, respectively, contained the largest number of animals in attested herds; how many such animals were in each of these counties, respectively; to what breeds of cattle these animals belonged; and if he had any statement to make on the subject.—Mr. MORRISON replied: With regard to the last part of the question, the herds most suitable for tuberculosis eradication are those maintained by breeding within the herd. Such herds are numerous in the counties of Carmarthen and Pembroke, in which the largest numbers of attested herds are located. The counties in England and Wales which contain the largest numbers of animals in attested herds are as follows:—

County.	Number of attested herds.	Cattle in attested herds.	
		Approximate number.	Breeds.
ENGLAND:			
Somerset ..	60	3050	Various.
Berks	34	2450	"
Essex	36	2150	"
Surrey	34	2150	"
Hampshire ..	38	1950	Mainly Guernsey and Jersey.
Gloucester ..	31	1800	Various.
WALES:			
Carmarthen ..	336	9450	Mainly shorthorn.
Pembroke ..	114	3100	Various, shorthorn predominating.
Cardigan ..	72	1950	Mainly shorthorn.

Local Authorities and Food and Drugs Powers

Mr. BULL asked the Minister of Health the number and names of councils which, under the new Food and Drugs Bill, would lose their authority in matters affecting the control of food and drugs in their respective areas.—Sir KINGSLEY WOOD replied: I presume that my hon. friend is referring to the councils of the 18 non-county boroughs, mentioned in the third interim report of the Local Government and Public Health Consolidation Committee. These are food and drugs authorities under the existing law, but which could not be such authorities under clause 64 of the Bill so long as their population does not amount to 20,000. The names of these councils are: Banbury, Barnstaple, Berwick-on-Tweed, Boston, Bridgwater, Bury St. Edmunds, Carmarthen, Clitheroe, Congleton, Glossop, Grantham, Kendal, Newark-on-Trent, Newbury, Penzance, Tiverton, Warwick, Wenlock. The position of 23 other boroughs with a population between 20,000 and 40,000 would depend upon whether a direction were given under the proviso to the clause that they should continue to be food and drugs authorities.

ROYAL MEDICAL BENEVOLENT FUND.—At a recent meeting of the committee 19 annuities and 45 grants were awarded. The total amount voted was £1650. The following are particulars of three cases:—

Widow, aged 69, of M.R.C.S. who died in January, 1938, and whose estate consists solely of the house now occupied, a 1934 Austin 10 h.p. car, and the household furniture. After sale of the house and payment of outstanding debts it is expected the capital remaining will not exceed £300. The widow has received no money since her husband's death. The fund sent an immediate gift of £5 and has voted a further £46 for this year. Application is being made to other societies for assistance for this poor lady.

Widow, aged 83, of L.R.C.P. who died in 1915, is living with her two sisters. One sister, a skilled nurse, looks after the widow and other sister, who is also an invalid. The doctor in attendance reported that the widow is suffering from arthritis and is completely crippled, and emphasised the necessity of her having a permanent attendant, but her financial position would not allow of this. Fund voted £26.

Doctor, aged 65, wife aged 48. The doctor is suffering from progressive muscular atrophy. Fund voted £80 per annum to the doctor and £26 per annum to his wife. The shipping firm for which he worked as a surgeon is contributing £30 per annum.

New annual subscribers are urgently needed by the fund. Cheques may be sent to the hon. treasurer of the fund, 11, Chandos-street, London, W.1.

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PUBLIC HEALTH

The Midwife and Her Training

ON the first day of next month the new rules of the Central Midwives Board for the longer training of midwives begin to come into force. The length of training will be extended from six months to one year in the case of trained nurses and from one year to two years in all other cases, divided into (1) a period of six or eighteen months according to whether the pupils are or are not trained nurses, (2) a period of six months for all pupils. Only on completion of the second part can the examination for the certificate of the C.M.B. be taken.

Under Section 7 of the Midwives Act, 1936, local supervising authorities are under an obligation to arrange for all practising midwives in their area to take post-certificate courses, and the C.M.B. have now made rules prescribing the nature and the extent of these courses. All practising midwives are required to take these courses at least once in seven years with a view to maintaining contact with modern theory and practice.

Grants are payable by the Treasury in aid of the training of persons intending to practise as midwives (see Memo. 211/MCW, 1*d.*), through training institutions recognised by the C.M.B., at the rate of £20 per pupil for each period of six months' training and £52 10*s.* for the eighteen months' period. To be eligible for a grant the candidate must declare her intention to practise. Proportionate grant will also be payable in respect of post-certificate courses.

In view of the already long training imposed on health visitors, it has been decided that in future their midwifery training need only extend to Part I of the new training course for midwives. Grant will be payable in respect of this portion at the rate applicable to intending midwives.

The New Public Health

In the last few years two tendencies have been apparent in the development of the public health services and are emphasised in the annual report of the Department of Health for Scotland.[1] The first has been the evolution of a system of unbroken medical supervision throughout childhood and adolescence. In the earlier part of this century the efforts of preventive medicine were directed at certain defined objects; thus the high death-rate during the first year of life was met by an efficient infant welfare service, and the loss of school attendance through ill health led to the creation of a school medical service. It gradually became clear, however, that many infantile deaths and much of the sickness of school-children were due to causes which had operated at an earlier age—namely, before or during birth or in the pre-school period. This has necessitated the extension of services to cover the health of the expectant mother and to provide skilled assistance at childbirth, and the establishment of clinics and nursery schools for the routine examination and treatment of children under school age. Finally, the gap between school life and the time when insurance benefit becomes available is being bridged by extending insurance facilities to juveniles under 16 and by supplying insurance practitioners with information from the school records.

[1] Ninth annual report of the Department of Health for Scotland. 1937. London: H.M. Stationery Office. Pp. 220. 3*s.* 6*d.*

The second tendency is in the organisation of the health services themselves. This has depended upon the fact that the financial and general resources of the smaller areas of local government have no longer been sufficient to keep pace with the increasing complexity and specialisation of the treatment of the sick. In the tuberculosis service, for example, even the minor local authority was financially competent to erect a small institution to provide the patients of its district with rest and nursing under open-air conditions, but the increasing use of radiology, the introduction of collapse therapy, and the employment of surgery for certain cases have entirely altered the situation, and the small sanatorium maintained by a single authority must now give place to a large well-staffed and well-equipped institution in which the authorities of a large district coöperate. Modern orthopædic schemes have shared in this regional planning, as have the hospitals for infectious diseases, which now aim at providing the best possible treatment for the patient and not merely isolation for the protection of the community. Large-scale rationalisation has still to be applied to the hospital services, but it is in that sphere that coöperation over wide areas is most essential in order to avoid overlapping, waste, and the uneconomical employment of expensive equipment. There is no room for parochialism in modern medicine.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED APRIL 9TH, 1938

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 1990; diphtheria, 1351; enteric fever, 17 (28 "expected"); pneumonia (primary or influenzal), 1086; puerperal fever, 199; cerebro-spinal fever, 41; acute poliomyelitis, 5; acute polio-encephalitis, 2; encephalitis lethargica, 9; dysentery, 87; ophthalmia neonatorum, 103. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on April 15th was 5436, which included: Scarlet fever, 802; diphtheria, 1140 (carriers 45); measles, 2220; whooping-cough, 264; puerperal fever, 15 mothers (plus 9 babies); encephalitis lethargica, 283; poliomyelitis, 1. At St. Margaret's Hospital there were 26 babies (plus 13 mothers) with ophthalmia neonatorum.

Deaths.—In 125 great towns, including London, there was no death from small-pox or enteric fever, 56 (15) from measles, 5 (0) from scarlet fever, 20 (3) from whooping-cough, 44 (7) from diphtheria, 50 (14) from diarrhœa and enteritis under two years, and 56 (8) from influenza. The figures in parentheses are those for London itself.

Measles was fatal in 27 great towns; Manchester had 4 deaths, Reading, Barnsley, Hull, and Salford each 3. Diphtheria was fatal in 30 great towns, Liverpool reporting 5 deaths. Birmingham reported 10 deaths from influenza.

The number of stillbirths notified during the week was 285 (corresponding to a rate of 40 per 1000 total births), including 44 in London.

INSTITUTE OF BRITISH SURGICAL TECHNICIANS.—A lecture on the uses of instruments in surgical technique will be given by Mr. W. H. Ogilvie to this institute on Friday, April 29th, at 8.15 P.M., at the Welbeck Hotel, Welbeck-street, London, W. Members of the medical profession may obtain tickets from the secretary of the institute, 6, Holborn-viaduct, London, E.C.1.

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OBITUARY

SIR ROBERT HILL, K.C.B., F.R.C.S.

Surgeon Vice-Admiral Sir Robert Hill, who died on April 18th at Henley in his seventy-third year, was honorary surgeon to the King and was recognised throughout his career as one of the best all-round surgeons in the Navy. Son of Dr. Samuel Hill, who practised in Mecklenburg-square, he qualified in 1888, taking the F.R.C.S. Eng. five years later. He joined the Navy in July, 1890, and retired at his own request as medical director-general in October, 1923. As staff surgeon he served in H.M.S. *Ophir* during the Royal Colonial tour of 1901 and as fleet surgeon he served in H.M.S. *Renown* during the tour of the Prince and Princess of Wales in India (1905–06), as well as in H.M.S. *Medina* during the Royal Indian tour of 1911–12. In the early part of the late war he did valuable surgical work at the Royal Marine Infirmary, Deal, and in February, 1916, he was appointed to H.M.S. *Iron Duke* as principal medical officer to the Grand Fleet on Admiral Jellicoe's staff. He was specially recommended for promotion for services rendered in the action of Jutland, when Jellicoe described him as "a most valuable medical officer with great organising ability." He was created K.C.M.G. in 1919 on his appointment as director-general.

A colleague writes: "Sir Robert Hill had a charming personality and was popular with the officers of all branches of the Service, amongst whom he had an unusually large number of acquaintances. He was a delightful senior to work under and his great experience in all departments at sea or on shore was most helpful when difficult questions arose. He was always pleased to see any of the officers of the medical branch, and did his utmost to help them, possessing as he did a thorough knowledge of their capabilities and the posts they would most suitably fill. When he was appointed director-general he had a busy time, dealing especially with the reduction of the medical personnel, but he never allowed himself to be worried, and his good humour surmounted any difficulty. The position of medical director-general gained in dignity during his tenancy of it, and when he retired the medical officers felt they had lost a capable guide and a good friend."

Dr. MICHAEL GRABHAM, who died at Quinta do Val, Madeira, on April 13th, was son of the Dr. Michael Grabham who practised in Madeira during the whole of his long life. After graduating at Cambridge he qualified from St. Thomas's in 1891 and practised for many years at Kingston, Jamaica. He was in his seventy-second year.

Mr. CHARLES EDWIN TRUMAN, a governor of St. Thomas's Hospital, who died at Upton, Slough, on April 14th in his eighty-ninth year, had been surgeon-dentist to the hospital and to H.M. Household. He was the only son of Mr. E. T. Truman, M.R.C.S., who combined medicine with the expert knowledge of telegraphy which entitled him to give substantial help in the laying of the first Atlantic cable. After taking the natural sciences tripos at Cambridge in 1871 Mr. Truman became M.R.C.S. in 1875 and L.D.S. in 1881. He was a member of the Odontological Society and surgeon also to the Dental Hospital of London. His wife, who was a descendant of Archbishop Herring, predeceased him by a few months.

MEDICAL NEWS

British Postgraduate Medical School

Dr. H. Gardiner-Hill will give six lectures in the department of medicine on diseases of the ductless glands on Tuesdays beginning on May 10th. On Thursdays beginning on May 26th Prof. J. C. Drummond, D.Sc., will lecture in the department of pathology on practical aspects of modern vitamin research. All the lectures will be held at 4.30 P.M. A limited number of tickets are available to medical practitioners and may be had from the dean of the school, Ducane-road, London, W.12.

Health and Cleanliness Council

At a luncheon held at the Holborn Restaurant on April 13th, Dr. G. F. Buchan, president of the council, presided, and Lord Horder proposed the toast of The Council. This stood, he said, for preventive medicine in regard to the individual and in regard to the home. Little children took kindly to cleanliness if they were shown how and were given the necessary facilities. A dirty tenant made a dirty house, and dirty houses helped to make new slums; the council aimed at seeing that no tenant contributed towards the making of slums by giving advice to the housewife. The Council had three great allies in its work—the mother, the school teacher, and the child; so long as it concentrated upon these three it could not fail in its work. Dr. Buchan, in reply, said he became more convinced as time went on that cleanliness was the foundation of all health work. In 1937 the council took part in 320 baby weeks, 650 lectures were given to audiences totalling nearly 50,000, the cinemotor displayed health films in every part of the country, and nearly 4,000,000 leaflets on health educational matters were distributed. At the suggestion of Dr. J. A. Fairer a conference of health workers had been held in Leicester. He realised that the achievement of cleanliness meant large expenditure, but it was money well spent for the reduction in infantile mortality. The council hoped the campaign would achieve the emancipation of the housewife from household drudgery by the introduction of various mechanical and electrical devices.

British Orthopædic Association

The Robert Jones gold medal and prize of £50 for 1937 has been awarded to Mr. H. Jackson Burrows for his essay on coxa plana.

Royal College of Physicians of Edinburgh

Dr. E. A. Carmichael will deliver the Morison lectures on the study of reflex activity of the human autonomic nervous system in the hall of the College on Thursday and Friday, May 26th and 27th, at 5 P.M.

The college will shortly make an award of the Dr. Jessie Macgregor prize in medical science.

The value of the prize is about £50, and all medical women who are graduates in medicine of the University of Edinburgh or who have taken the triple qualification and studied for at least a year in Edinburgh before qualification are eligible. The successful candidate will deliver a lecture to the medical profession in Edinburgh on the work she has submitted. Further particulars will be found in our advertisement columns.

Pathological Research in its Relation to Medicine

Our advertisement columns contain particulars of a course of lectures on this subject to be given in the institute of pathology and research at St. Mary's Hospital at 5 P.M. on Tuesdays from April 26th to June 14th. The first will be given by Dr. Donald Hunter, who will speak on the toxicology of certain compounds of lead, arsenic, and mercury. Other speakers will be Sir Thomas Lewis, F.R.S., Dr. R. A. Young, Prof. John Mellanby, F.R.S., Prof. Matthew Stewart, Prof. B. A. McSwiney, Sir Henry Dale, F.R.S., and Sir John Fraser. The lectures are open to all members of the medical profession.

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Royal Society of Medicine

The gold medal of this society, given triennially in recognition of services to the science and art of medicine, has been awarded to Prof. Wilfred Trotter, F.R.S., director of the surgical unit at University College Hospital, London. Mr. Trotter is the seventh recipient of the medal, his predecessors being Sir Almroth Wright, Sir Gowland Hopkins, Prof. J. S. Haldane, Sir Henry Head, Sir Thomas Barlow, and Sir Archibald Garrod.

Society for Relief of Widows and Orphans of Medical Men

At a quarterly court of directors held on April 6th, Mr. V. Warren Low, the president, being in the chair, the annual report and financial statement for 1937 was submitted and approved. During the year £4702 10*s.* had been distributed in grants to the widows and orphans. There was a surplus of income over expenditure of £513, due partly to the inability, owing to the increase of the number of widows in receipt of grants, to make a Christmas present to them. A donation of £127 4*s.* had been received from the Bovril Medical Agency. The annual general meeting will be held on May 25th. Membership is open to any registered medical man who at the time of his election is residing within a twenty-mile radius of Charing Cross. Particulars from the secretary, 11, Chandos-street, London, W.1.

British Empire Cancer Campaign

At a quarterly meeting of the grand council held in London last week a further grant of £1000 for one year was placed at the disposal of the north of England council to enable the "short"-wave investigations to be continued under the direction of Mr. F. Dickens, Ph.D., and Mr. S. F. Evans, Ph.D. (see *Lancet*, April 2nd, p. 787). The grand council decided to allot a further sum of £1338 for one year for extension of the work of the central propaganda committee, which will now proceed to arrange free educational lectures in Cornwall, Devon, Dorset, Gloucestershire, Somerset, Wiltshire, and in South Wales. Mr. Malcolm Donaldson, chairman of the committee, reported that over 700 public lectures have been given in fifteen English counties. Sir Charles Gordon-Watson reported that the organisation for the statistical cancer inquiries in the teaching and special hospitals of London and the hospitals of the London County Council and the Middlesex County Council have now been completed. All these institutions had appointed registrars to take charge of the records, and the headquarters' arrangements were being perfected to deal with the data concerning over 17,000 new cases of cancer yearly in the metropolitan area.

SUCCESS OF THE LONDON AMBULANCE SERVICE

THE statistics of the London Motor Ambulance Service for 1937 exhibit the continuous growth of that beneficent municipal provision. There were no fewer than 55,486 calls last year, or 13,000 more than in 1933. The 25 ambulances in commission working from 16 stations travelled 264,464 miles and the average time taken to reach cases was 7·1 minutes, or if street accident cases only were considered 6·6 minutes. The largest number of calls was in the month of May, and Friday was the day in the week for which an ambulance was most frequently summoned, Saturday and Monday following next in order. The hour of noon till 1 o'clock was that when an ambulance was most in request, closely followed by 6–7 and 3–4 P.M. Lambeth appears to be the borough council area from which most calls were received. The largest number of calls was for street accidents (16,289), while there were 8590 for accidents elsewhere than in the street. No fewer than 12,665 or 22 per cent. of the whole number of calls were for cases of parturition. That the public are now familiarised with the availability of the service is shown by the fact that they made 29,108 calls, against 18,073 from the police. When the obstacles which were placed in the way of passing the Metropolitan Ambulances Act between 1906 and 1909 and the opposition to its effectuation in 1909 to 1915 are recalled (see *Lancet*, 1936, **2**, 720), it is easy to see how ill-informed was the obstruction.

Vacancies

For further information refer to the advertisement columns

Accrington, Victoria Hosp.—H.S., at rate of £175.
Altrincham General Hosp.—Sen. and Jun. H.S.'s, £150 and £120 respectively.
Bangor, Caernarvonshire and Anglesey Infirmary.—Jun. H.S., £120.
Barnsley, Beckett Hosp. and Dispensary.—Cas. O., £250.
Birmingham, Canwell Hall Babies' Hosp.—Res. M.O., at rate of £250.
Birmingham City, Maternity and Child Welfare Dept.—M.O., £600.
Birmingham and Midland Eye Hosp.—H.S., at rate of £130.
Bristol City and County.—Asst. M.O.H., £500.
Dartford, Bergman Osterberg College.—Lecturer in Physiology and Hygiene.
Dudley, Guest Hosp.—Res. Surg. O., at rate of £250–£300. Also H.S., at rate of £100–£130.
Dundee Mental Hosp., Westgreen.—Jun. Asst. M.O., £300.
Edgware, Redhill County Hosp.—Visiting Dermatologist, 3 guineas per session.
Edinburgh, Royal College of Physicians.—Dr. Jessie Macgregor Prize in Medical Science, £50.
Halifax Royal Infirmary.—Second H.S. to Eye, Ear, Nose, and Throat and Medical Dept., at rate of £175.
Hastings, Royal East Sussex Hosp.—Jun. H.S., at rate of £150.
Hendon Borough.—Asst. M.O.H. and Asst. School M.O., £600.
Holland (Lincs) County Council.—Asst. M.O.H., £700.
Hosp. for Sick Children, Great Ormond-street, W.C.—Res. Asst. Physician, £200. Out-patient M.O., £150. Two Res. Med. Assts. and Clin. Pathologists, each £125. Asst. Res. Surg. O., £100. Also H.S., at rate of £50.
Huddersfield County Borough.—Asst. M.O.H., £500.
Huddersfield Royal Infirmary.—H.S. to Abnormal Maternity Dept., H.S. to Ear, Nose, and Throat Depts., and H.S., each at rate of £150.
Ilford, King George Hosp.—Asst. Cas. O. and H.S. to Spec. Depts., at rate of £100.
Isleworth, West Middlesex County Hosp.—Res. Cas. M.O., £350.
King Edward Memorial Hosp., Ealing.—Cons. Physician and Second Cons. Laryngologist. H.S. to Special Depts., at rate of £150. Ophth. Surgeon, also 2 Hon. Anæsthetists.
Leicester City General Hosp.—Res. M.O., at rate of £300.
Lewisham Metropolitan Borough.—Asst. Maternity and Child Welfare M.O., £600.
London Chest Hosp., Victoria Park, E.—Med. Reg., £175.
London Corporation.—M.O.H. for Port of London, £1500.
London County Council.—Asst. M.O.'s, each £470. Also Asst. M.O.'s, Grade II, each £250.
London Lock Hosp., 283, Harrow-road, W.—Res. M.O., at rate of £175.
Maidenhead Hosp., Berkshire.—Hon. Surgeon to Ear, Nose, and Throat Dept.
Manchester Royal Eye Hosp.—Out-patient M.O., £200.
Manchester Royal Infirmary.—Bacteriologist for post of Director of Clin. Laboratory, £800. Also Chief Asst. to Surg. Unit, £250.
Manchester, Withington Hosp.—Asst. M.O., at rate of £200.
Middlesex County Council.—Asst. Dental Officer, £500.
Middlesex Hosp., W.—Obstet. and Gynæcological Reg., £300.
Mount Vernon Hosp., Northwood.—H.S., at rate of £150.
Newcastle, University of Durham and Royal Victoria Infirmary.—Professorship of Pathology and Pathologist, £1100.
Newcastle-upon-Tyne Royal Victoria Infirmary.—Reg. to Orthopædic Dept., £150.
Newport, Mon., Royal Gwent Hosp.—H.S. to Fracture and Orthopædic Dept. and Cas. O., each £135.
Nottingham City Hosp.—Res. Asst. Surg. O.'s, each at rate of £250.
Nottingham General Hosp.—Res. Cas. O., at rate of £150.
Oxford, Wingfield-Morris Orthopædic Hosp., Headington.—H.S., at rate of £120.
Paddington Green Children's Hosp., W.—H.S., at rate of £150. Also two Clin. Assts.
Plymouth, Prince of Wales's Hosp., Devonport.—Jun. H.S., at rate of £120.
Preston Royal Infirmary.—Cas. O., at rate of £150.
Queen's Hosp. for Children, Hackney-road, E.—Cas. O., at rate of £100.
Queen Mary's Hosp. for the East End, Stratford, E.—Hon. Asst. Surgeon.
Rochdale Infirmary and Dispensary.—Second H.S., £150.
Rotherham Hosp.—H.P., £180.
Royal Free Hosp., Gray's Inn-road, W.C.—Sen. Res. M.O., £150.
Royal London Ophthalmic Hosp., City-road, E.C.—Out-patient Officer, £100.
Royal Naval Dental Service.—Dental Officers.
Royal Naval Medical Service.—Medical Officers.
St. Bartholomew's Hosp., E.C.—Part-time Chief Asst. in X Ray Diagnostic Dept.
Salisbury General Infirmary.—H.P., at rate of £125.
South-Eastern Hosp. for Children, Sydenham, S.E.—Hon. Asst. Surgeon.
Staffordshire General Infirmary.—Sen. H.S., at rate of £175.
Stirling District Mental Hosp., Larbert.—Jun. Asst. M.O., £300.
Stoke-on-Trent, Burslem, Haywood, and Tunstall War Memorial Hosp.—Res. H.S., at rate of £175.
Stoke-on-Trent City.—M.O. for V.D. Centre, £750.
Stoke-on-Trent, North Staffordshire Royal Infirmary.—Res. Anæsthetist, at rate of £150.
Stoke-on-Trent, Stanfield Sanatorium.—Res. M.O., £250.
Sunderland Royal Infirmary.—Jun. H.S., £120.
Wakefield Mental Hosp.—Asst. M.O., £350.
Weir Hosp., Grove-road, S.W.—Jun. Res. M.O., £150.
Wembley Borough.—Asst. M.O.H., £500. Also Part-time Asst. M.O., 1½ guineas per session.

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West London Hosp., Hammersmith-road, W.—Chief Asst. to Dept. for Chronic Rheumatic Diseases, £100.
Westminster Hosp. Convalescent Home, Parkwood, Swanley, Kent.—Res. M.O., at rate of £200.
Worcester Royal Infirmary.—Jun. H.S., £120.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Llandrindod Wells (Radnor), Billingborough (Lincolnshire), Haddenham (Cambridgeshire), and West Calder (Midlothian).

Medical Diary

April 25th to May 1st

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
MONDAY.
Odontology. 8 P.M., Mr. S. Wilson Charles: The Developmental Movements of the Teeth. Mr. G. T. Hankey: Osteitis Fibrosa (Local) of Mandible Simulating Osteogenic Sarcoma.
TUESDAY.
Medicine. 5 P.M. (cases at 4 P.M.), clinical meeting at the Middlesex Hospital.
WEDNESDAY.
Epidemiology and State Medicine. 8.15 P.M., Dr. W. A. Daley: School Life and After for the Handicapped Child.
THURSDAY and FRIDAY.
Urology. Annual general meeting in Stockholm.

MEDICO-LEGAL SOCIETY.
THURSDAY.—8.30 P.M. (26, Portland-place, W.), Mr. William Latey: Medico-legal Aspects of the Matrimonial Causes Act, 1937.

CHELSEA CLINICAL SOCIETY.
TUESDAY.—8.30 P.M. (Hotel Rembrandt, Thurloe-place, S.W.), Dr. L. I. M. Castleden: The Uses of Dyes in Medicine.

ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY, 5, Lisle-street, W.C.
WEDNESDAY.—4.30 P.M., clinical cases. 5 P.M., Dr. J. H. T. Davies: Minor Surgery of the Skin with Special Reference to Biopsy.

BRITISH PSYCHOLOGICAL SOCIETY.
Medical Section.
WEDNESDAY.—8.30 P.M. (Tavistock Clinic, Malet-place, W.C.). Dr. H. G. Baynes: Psychological Demonstration of the Drawings of a Schizophrenic Artist.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES.
FRIDAY.—8.30 P.M. (11, Chandos-street, W.), Dr. A. J. Galbraith: Some Problems in the Histopathology of General Paralysis of the Insane.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane-road, W.
MONDAY.—2.30 P.M., Sir Edmund Spriggs: Diseases of Small and Large Intestine.
WEDNESDAY.—Noon, clinical and pathological conference (medical). 3 P.M., clinical and pathological conference (surgical). 4.30 P.M., Dr. C. H. Andrewes: Recent Work on Viruses.
THURSDAY.—2.15 P.M., Dr. Duncan White: radiological demonstration. 3.30 P.M., Mr. Victor Bonney: Malignant Neoplasms of Uterus.
FRIDAY.—2 P.M., clinical and pathological conference (obstetrics and gynæcology).
Daily, 10 A.M. to 4 P.M., medical clinics, surgical clinics and operations, obstetrical and gynæcological clinics and operations.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY.—2 P.M., Mr. H. C. Apperly: The Milk Teeth. 3 P.M., Dr. Alan Moncrieff: Causes and Diagnosis of Enlarged Cervical Glands.
Out-patient clinics daily at 10 A.M. and ward visits at 2 P.M.

HOSPITAL FOR EPILEPSY AND PARALYSIS, Maida Vale, W.
THURSDAY.—3 P.M., Dr. Blake Pritchard: clinical demonstration.

ST. MARY'S HOSPITAL, W.
TUESDAY.—5 P.M. (Institute of Pathology and Research), Dr. Donald Hunter: Observations on the Toxicology of Certain Compounds of Lead, Arsenic, and Mercury.

NATIONAL HOSPITAL FOR DISEASES OF THE HEART, Westmoreland-street, W.
TUESDAY.—5.30 P.M., Dr. Paul Wood: Pericarditis.

FELLOWSHIP OF MEDICINE AND POSTGRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY to SUNDAY.—MAUDSLEY HOSPITAL, Denmark-hill, S.E., afternoon course in psychological medicine.—SATURDAY and SUNDAY.—INFANTS HOSPITAL, Vincent-square, S.W., course in children's diseases.

ST. JOHN CLINIC AND INSTITUTE OF PHYSICAL MEDICINE, Ranelagh-road, S.W.
FRIDAY.—4.30 P.M., Dr. G. T. Calthrop: Radiography in Physical Medicine.

MANCHESTER ROYAL INFIRMARY.
FRIDAY.—4.15 P.M., Dr. William Brockbank: clinical demonstration.

Appointments

CRAN, E. M., M.B. Aberd., Junior Assistant Medical Officer at the City General Hospital, Plymouth.
DOBBS, R. H., M.B. Camb., M.R.C.P. Lond., Hon. Physician to the Children's Department of St. John's Hospital, Lewisham.
HARDY, A. J., M.R.C.S. Eng., Assistant Medical Officer at the City General Hospital, Plymouth.
MACKEITH, S. A., M.R.C.S. Eng., D.P.M., Hon. Consulting Physician in Charge of the Department of Psychological Medicine at Warneford General Hospital, Leamington Spa.
MCKENZIE, W. S., M.B. Camb., Registrar and Clinical Tutor at the Central London Throat, Nose, and Ear Hospital.
PAYTON, C. G., M.D. Birm., M.B. Edin., D.P.H., Assistant County Medical Officer for Dorset.
WYNTER, TAMSIN M., M.D. Lond., D.A., Anæsthetist to the Department of Neurosurgery at the London Hospital.
London County Council Hospital Staff.—The following promotions are announced. D.M.S. = Deputy Medical Superintendent, A.M.O. = Assistant Medical Officer, (I) or (II) = Grade I or II:—
JEMSON, JAMES, F.R.C.S. Eng., D.M.S. (I), St. Alfege's;
JONES, A. N., M.B. Liverp., F.R.C.S. Eng., D.M.S. (II), St. Pancras;
KARRAN, C. W. C., M.B. Camb., D.C.O.G., A.M.O. (I), Park;
CHRISTIE, A. B., M.B. Aberd., D.P.H., A.M.O. (I), Eastern;
HALL, H. W., M.B. Edin., D.P.H., A.M.O. (I), Brook; and
SETTLE, H. L., M.B. Manch., A.M.O. (I), Grove.
St. George's Hospital.—The following appointments are announced:—
BURNS, B. H., B.Chir. Camb., F.R.C.S. Eng., Surgeon;
PINCKNEY, CHARLES, M.B. Camb., M.R.C.P. Lond., Physician in Charge of the Children's Department; and
ROBSON, KENNETH, M.B. Camb., M.R.C.P. Lond., Assistant Physician.
Certifying Surgeons under the Factory and Workshop Acts: Dr. J. T. MURPHY (Cullompton District, Devon); Dr. G. S. CHRISTIE (Fordoun District, Kincardine); Dr. A. S. BEER (Thame District, Oxford); Dr. W. E. S. MORETON (Reynoldston District, Glamorgan); Dr. J. C. CHRISTIE (Perth District, Perth); Dr. J. H. FISHER (Abingdon District, Berks); Dr. J. P. LOGAN (Kelvedon District, Essex).
Medical Referee under the Workmen's Compensation Act, 1925: A. H. VISICK, M.B., B.S., F.R.C.S., of York, for the Harrogate, Ripon, Tadcaster, Helmsley, and York County Court Districts (Circuit No. 14).

Births, Marriages, and Deaths

BIRTHS

DEBENHAM.—On April 10th, at Addison-road, W., the wife of Dr. Gilbert Debenham—a son.
HOUGHTON.—On April 15th, at Berkhamsted, the wife of Mr. L. Wynn Houghton, F.R.C.S.E.—a son.
PRYCE.—On April 7th, at Welbeck-street, W., the wife of Dr. D. Merlin Pryce—a son.
SADLIER.—On April 14th, the wife of Dr. H. W. Sadlier, Buxted, Sussex—a daughter.
STEVENS.—On April 13th, the wife of Mr. T. Russell Stevens, F.R.C.S., of Dorchester—a daughter.
THOMAS.—On April 15th, at Reading, the wife of Dr. Clifford Thomas—a son.
WALLACE.—On April 10th, the wife of Dr. Caleb Paul Wallace of West Clandon, Surrey—a son.

MARRIAGES

EDKINS—HOWLAND.—On April 9th, in London, John R. P. Edkins, M.D., to Kathleen Howland.
HINKSMAN—WILLIS.—On April 14th, at Bloomsbury Baptist Church, John Forrest Hinksman, M.B. Edin., to Marjory Edith, daughter of the late Rev. R. Elgar Willis, of Ipswich.

DEATHS

BANISTER.—On April 16th, John Bright Banister, M.D. Camb., F.R.C.P. Lond., F.R.C.S. Edin., F.C.O.G., of Berkeley Court, N.W., and Manor House, Tatsfield.
FOSTER.—On April 13th, Claud Sanderson, L.M.S.S.A. Lond., of St. George's-road, S.W., and of Worthing, aged 63.
GRABHAM.—On April 13th, at Quinta do Val, Madeira, Michael Grabham, M.B., B.Chir. Camb., elder son of the late Dr. Michael Grabham, aged 71.
HILL.—On April 18th, at Henley, Surgeon Vice-Admiral Sir Robert Hill, K.C.B., K.C.M.G., C.V.O., F.R.C.S. (Eng. and Edin.), in his 72nd year.
JOYCE.—On April 17th, at Nice, John Hall Joyce, M.B. Camb., aged 69.
MCGREGOR.—On April 15th, at Torquay, John McGregor, M.D. Glasg., formerly of Ayr.
STRANAGHAN.—On April 19th, at Bournemouth, Cyril Patrick Andrew Stranaghan, M.B. Edin.
SURRIDGE.—On April 17th, at Wenden, Saffron Walden, Edward Ernest North Surridge, M.B. Camb., aged 73.
TRUMAN.—On April 14th, at Upton, Slough, Charles Edwin Truman, M.R.C.S., L.D.S., Governor of St. Thomas's Hospital, late Surgeon-Dentist to His Majesty's Household, in his 89th year.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

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NOTES, COMMENTS, AND ABSTRACTS

NOISE AND ITS CONTROL

ONE of the most irritating of the minor evils of civilised life is noise. Hogarth's Enraged Musician would probably have been even more exasperated had he lived in the twentieth century instead of the eighteenth. Yet with the exceptions of Helmholtz and the late Lord Rayleigh, physicists for many years paid little attention to sound. The omission is rapidly being made up, largely because of the facilities for production of sounds of well-defined intensity as well as frequency afforded by developments arising out of radio reception. The National Physical Laboratory has for some years taken an interest in the measurement and control of sound, and in its report for 1937 (H.M. Stationery Office, 2*s*. 6*d*.) some account is given of work done with a standard objective noise meter, designed at Teddington. The determination of equivalent loudness in terms of the "phon" was based fundamentally on subjective observations, involving a number of observers and a technique suitable only to the laboratory, but an instrument consisting of microphone, amplifier, and rectifier has been devised in which the overall response to pure tones is so adjusted that, at the loudness of conversation and above, it gives equal reading for pure tones which appear equally loud to the ear, irrespective of pitch. "The freedom of objective meters from personal bias renders them of particular value as arbiters where it is desired to control noise by fixing an upper limit to the loudness permitted in given circumstances." With such a meter the investigation both of noise itself and of means of deadening it can be based on a rational quantitative basis, and the laboratory has carried out several investigations in both directions.

Mention has already been made in these columns (March 12th, p. 624) of the inquiry into motor-horn noises over which Dr. Kaye presided. With the aid of some 200 listeners of both sexes, and of ages between sixteen and sixty, an attempt was made to assess the annoyance value of motor-horns of all kinds to persons in their vicinity, as well as to evaluate the effectiveness of horns under normal conditions of use. It appeared that while no single measurable characteristic of a horn serves entirely to determine its objectionableness, the loudness of the sound is of major significance. A loudness of 95 to 100 phons at a distance of twenty feet annoys the average observer, but the driver of a moderately noisy vehicle appears to require a loudness of the order of 105 phons for adequate warning from overtaking vehicles. The committee of the Ministry of Transport for which this work was undertaken recommended that, under specified conditions of test, the noise of a motor-horn should not exceed 100 phons at a distance of twenty feet.

Much work has been done on the acoustics of buildings, both from the point of view of the willing listener in concert-rooms, church, or lecture-room and that of the flat-dweller or other listener to undesired noise. Experiments on the sound insulation of walls, floors, and ceilings have been made, some in experimental structures and others in actual buildings. The sound-transmitting properties of screens used for talking pictures have also been studied, and also means of impeding the transmission of sound along water-pipes.

Among the many investigations carried out at Teddington, these on sound seem to be of special interest to the medical profession, who in their consulting-rooms need both absolute privacy and freedom from external noise, and who, in the homes of their patients and in the public streets, see much of the nervous irritation and retarded recovery caused by excessive noise. Double windows, floors "floating" on rubber blocks more than an inch above the structural floor, and inner wall facings fixed to battens held in insulating clips have been found efficient for sound insulation of rooms. The insulating value of non-porous partitions is determined mainly by their weight, which tends to limit their applicability in buildings of light construction. The outer green baize doors of some consulting-rooms would seem to be an effective means of decreasing the sounding-board effect of the weakest part of the sound insulation of rooms.

WHY SURGEONS BECAME SURGEONS

IN 1910 Dr. Francis Reder of St. Louis, in collecting material for an address on "The Surgeon and his Work," wrote to fifty outstanding surgeons throughout the world inquiring why they became surgeons. The reasons given by the thirty-nine who replied included natural inclination from childhood (Sir John Bland-Sutton) and parental example (the brothers Mayo), admiration of a particular teacher or the family doctor, personal experience of surgical intervention, a natural taste for the tangible benefits of surgery to humanity (Sir Victor Horsley), and the more banal consideration of a fortuitous surgical opening. Dr. Reder tells us he has now presented these letters to the St. Louis Medical Society for preservation.

THE ROYAL BERKSHIRE HOSPITAL

A HUNDRED years ago the Royal Berkshire Hospital at Reading was being built. A year before its builder had begun to dig out the foundations, and a year later it was formally opened. The hospital has marked its centenary by the publication of a history[1] of its foundation and subsequent growth, the proceeds of which will go to the centenary appeal fund. The story is one of smooth and efficient progress. The hospital was founded at a time when money was plentiful and advances in medicine and surgery sufficiently dramatic to catch the public eye, and its expansion has run parallel with that of the district which it serves.

Like most provincial towns Reading had little in the way of medical service for the poor until the beginning of the nineteenth century, when there was a general awakening to the need for social development and for improvements in the public health. In 1802 the Reading Dispensary was founded in a building in Chain-street formerly occupied by a school. This was a highly popular institution, but it dealt only with out-patients, and by 1830 the demands made upon it were more than it could cope with. At that time a Mr. Richard Oliver, among others, made persistent efforts to arouse local interest in the establishment of a general hospital, and walked more than once to Windsor to interview William IV on the subject. In February 1836 the governors of the dispensary at last decided to devote their accumulated surplus of £5000 to the erection of a hospital. They had no lack of support from the town and district and the King and Queen agreed to be patrons of the new institution, a royal interest which has continued to the present day and is now shown by the signature of Queen Mary in the present history. Lord Sidmouth presented the building committee with five acres of his Early Court estate, and by April, 1837, a design had been approved, a tender of £6450 accepted, and construction began. It was intended that Lord Sidmouth should lay the foundation-stone on May 13th, but his ill health led to the ceremony being postponed and it was ultimately cancelled altogether because of the death of William IV on June 20th. The £12,000 which the hospital and its equipment was expected to cost was soon oversubscribed, and indeed the sole opposition came from the weather, which damaged the stone at the quarries and made the canals impassable. However, on May 27th, 1839, the building was ready to take its

[1] Story of the Royal Berkshire Hospital, 1837–1937. Edited by Ernest W. Dormer. Reading: The Poynder Press. Pp. 187.

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first patients. Two thousand Sunday-school children led an opening procession, twenty-nine toasts were duly drunk at a dinner at the Town Hall, and at last the hospital was opened.

In a hundred years the hospital has steadily expanded by the addition of special departments, a nursing-home for patients of moderate means, a convalescent home at Calcot, new operating theatres and the like, and the original 50 beds have become 350, but further building, which will cost £150,000, is necessary if it is to keep pace with modern requirements.

WATCHING CHILDREN AT PLAY

IN 1931 Miss D. E. M. Gardner organised a play centre for children in the Leeds Training College for Teachers with the object of providing opportunities for play for a limited number of children from poor and crowded homes. The experiment has been more than successful, for the play centre now forms an integral part of the college life and is open on four evenings a week to over 100 children between the ages of 3 and 14. The centre fulfils a double purpose, for it not only provides opportunities for children to play in an atmosphere of friendship and security essential to their normal development but it forms a valuable part of the school teacher's training. Miss Gardner tells us in a little book [1] how quickly the children respond to the opportunities offered them; how backward children are able to develop and become useful members of the centre, and how the unstable children respond to association with other children as well as to the sympathetic atmosphere of the centre. The accounts of group play activities, particularly of dramatic work, make interesting reading. The student has ample time to observe children playing spontaneously and to apply psychological principles learnt in the lecture rooms. She can watch for differences in the type of play normal for each age level and thus pick out abnormal children; and she can also gain experience in the handling of large groups of children. Miss Gardner has shown wisdom in allowing the needs of both children and students to determine the choice of material and the types of activity in the play centre, and it is to be hoped that other training colleges will follow her example.

DIET AND HEALTH—FOR THE LAYMAN

IN one of the many little books nowadays prepared for that apparently omnivorous reader the intelligent layman, Dr. Morris Fishbein [2] discusses in non-technical language such questions as calories, the cost of food and foodstuffs and diets for various ages and conditions. The chapter debunking fashionable and faddish diets is to be commended especially to the laywoman, not necessarily intelligent, who prefers emaciation, or something akin to it, to emancipation. The frivolous sketches that enliven the book are in strange contrast to the text, for Dr. Fishbein takes his, and our, food very seriously. He comments severely, for instance, on Marie Antoinette's famous remark, "Let them eat cake," the significance of which is not usually held to lie in its literal message. "That was bad advice," he says. "A slice of bread costs less than a piece of cake of the same size and offers more in the way of nutritional elements." Numerous dietetic charts and detailed weight-reducing menus are appended. It is difficult to call to mind any topic about which more clap-trap is talked and written than dietetics, and it is refreshing to find here a simple and sane account of diet and health.

[1] The Children's Play Centre. By D. E. M Gardner, Lecturer in Education at the City of Leeds Training College. London: Methuen and Co. 1937. Pp. 143. 3s. 6d.

[2] Your Diet and Your Health. By Morris Fishbein, M.D., Editor, Journal of the American Medical Association; Editor, Hygeia, the Health Magazine. London: McGraw-Hill Publishing Co. 1937. Pp. 298. 10s. 6d.

NEW PREPARATIONS

NICOTINIC ACID B.D.H.—Elsewhere in this issue will be found a paper from Cincinnati, and a clinical note from University College Hospital, on the use of nicotinic acid in pellagra. Dr. Spies and his colleagues are satisfied that this substance is an antipellagric factor, capable of removing mucous membrane lesions and of restoring strength; but in the *Journal of the American Medical Association* of April 2nd (p. 1081) Spies suggests that the peripheral neuritis often associated with the disease should be treated by injection of vitamin B_1. The British Drug Houses Ltd. (City-road, London, N.1) issue Nicotinic Acid B.D.H. in tablets to be taken by mouth, each tablet containing 30 mg. of the acid.

PRESTOBAND is the name given to a new surgical bandage. It looks like an ordinary cotton-gauze bandage, but the material has been treated so as to make it self-adhesive—i.e., it will stick to itself but not to skin or hair. The self-adhesion simplifies application, since no knots or pins are required, and the dressing will usually be less bulky and more effective for its size. Prestoband gives more support than ordinary gauze and, when applied to a finger for example, is not disturbed by washing. The makers are Vernon and Co., Ltd., Penwortham Mills, Preston, Lancs, but the bandages are supplied only through trade channels.

TAR DERMAMENT is a combination of an alcohol-soluble phenolic resin, having analgesic properties, with 6 per cent. of washed crude coal-tar. It is described as relatively non-toxic, mildly anæsthetic, and slightly vasoconstrictor. When it is painted on the skin the solvent evaporates leaving a covering of the resin which holds the tar at the place of application, and ensures direct and continuous contact of the antiseptic with the area under treatment. The makers (Parke, Davis and Co., Beak-street, W.1) recommend it for eczema, seborrhœa, psoriasis, pruritus, and other disorders of the skin.

ENTACARB POWDER, made by Reed and Carnrick (Canada) Ltd., Toronto, is intended for the treatment of gastric hyperacidity and each teaspoonful is said to contain approximately: calcium carbonate 15 grains, magnesium carbonate 6, sodium bicarbonate 3, potassium bicarbonate ½, colloidal aluminium silicate 12, and bismuth subcarbonate 2. "Calcium is the chief alkalising agent. Magnesium, sodium and potassium salts are added in the proper proportions to bring about a prompt neutralising effect and a gentle laxative action." The calcium is held to have an antispasmodic action, and the bismuth and aluminium silicate are locally soothing. Besides Entacarb Powder the manufacturers sell coated Entacarb Tablets which break up in the duodenum and are meant for general alkalisation. The distributors in Britain are Coates and Cooper Ltd., 94, Clerkenwell-road, E.C.1.

We have received from the ARMOUR LABORATORIES (Armour House, St. Martin's-Le-Grand, E.C.1) a booklet describing their "Glanoid" Anterior Pituitary Factors, which are standardised physiologically. Those available are a growth factor, gonadotropic ("maturity") factors, a lactogenic factor (prolactin), a thyrotropic factor, an adrenotropic factor, and a polyvalent extract (Polyansyn) said to contain all the hormones of the anterior pituitary. It is emphasised that these products are not "anterior pituitary-like" preparations, but are obtained only from the anterior lobe of the pituitary gland.

A small book on the Treatment of Neurosyphilis and Trypanosomiasis with Tryparsamide has been prepared by PHARMACEUTICAL SPECIALITIES (MAY AND BAKER) LTD. (Dagenham, Essex). Copies may be had on application.

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ADDRESSES AND ORIGINAL ARTICLES

MALIGNANT HYPERTENSION *

By Arthur Ellis, O.B.E., M.D. Toronto, F.R.C.P. Lond.

DIRECTOR OF MEDICAL UNIT, LONDON HOSPITAL; PROFESSOR OF MEDICINE, UNIVERSITY OF LONDON

(WITH ILLUSTRATIVE PLATE)

One hundred and ten years ago Richard Bright pointed out the association of enlargement of the heart and chronic disease of the kidney; ever since that time this association has been a subject of interest to both physicians and pathologists. It was Clifford Allbutt, using purely clinical means, who first clearly separated arterial hypertension without obvious renal involvement from chronic nephritis with hypertension. There thus arose the conception of a primary arterial hypertension independent of renal disease, to be distinguished from the secondary hypertension seen in patients with chronic nephritis. To this primary arterial hypertension Allbutt gave the name hyperpiesia, a term which has become firmly established in English medical terminology. In most other countries the condition is known as essential hypertension.

The separation of essential hypertension from chronic nephritis with hypertension marked a great advance in our knowledge of high blood pressure and its relation to kidney disease. As time went on, however, a difficulty arose. One group of patients with hypertension failed to fit satisfactorily into this new classification. I refer to a group of patients in whom the clinical course of the disorder suggests a primary hypertension, but signs of renal impairment eventually develop and death in renal failure often occurs. It is to this condition that we refer when we use the term malignant hypertension.

In this country these patients have usually been classified, along with examples of true renal disease, as chronic interstitial nephritis. At the London Hospital they are classified pathologically, according to the classification of Russell, as chronic nephritis repens, Type IV. This term assumes the condition to be the result of a slowly progressive, long-standing creeping nephritis. The difficulty of this conception is, that though these patients may die of renal failure and show at post-mortem examination renal lesions of inflammatory type, their clinical picture is essentially that of arterial hypertension of great severity with a rapidly downhill course. It does *not* suggest long-standing renal disease; moreover, if such long-standing renal disease were present we might expect these patients to have albuminuria for many years before other symptoms appeared. In view of the widespread practice of medical examination for life insurance, such an occurrence could not have escaped notice. Yet it may be stated with certainty that evidence of this kind is entirely lacking.

As I have already said, the designation malignant hypertension has recently been given to this condition, and I have used it for the title of this lecture. Malignant is a word of ill omen, unsatisfactory for employment at the bedside, but the term is already so widely used that to attempt to change it now would but lead to confusion; it *does* serve the purpose of underlining the contrast between this grave condition and the common form of essential hypertension with its long course which is relatively benign.

The material on which this lecture is based consists of 40 fatal cases of malignant hypertension in which post-mortem examinations have been carried out in the London Hospital between 1930 and 1937. With one or two exceptions all these patients have been seen by me during life, in most instances also by Horace Evans, and in recent years also by Clifford Wilson, both of whom have so loyally helped me in this investigation. Many of the patients have been seen repeatedly throughout their illness. In every case, thanks to the courtesy of Prof. H. M. Turnbull, a histological study of the kidneys, and of the other available organs, has been made by me, assisted again by Clifford Wilson.

I propose first to give a brief outline of the disorder in its classical or fully developed state, and to show the histological lesions which are found in the various organs; then to discuss the natural history of the disease and to present evidence, both clinical and histological, that it is a generalised vascular disturbance of which the *renal* lesions are a late, and indeed almost terminal, manifestation; and finally to emphasise certain points in regard to the diagnosis, prognosis, and treatment of malignant hypertension which seem to me important.

THE CLASSICAL OR FULLY DEVELOPED PICTURE

An adult, usually a man of 40–50 years of age—that is, below the age when symptoms of essential hypertension usually appear—who has previously been in good health, complains suddenly of attacks of headache and vomiting on waking in the morning, or of attacks of precordial pain and breathlessness on exertion, or of suddenly failing vision. He is found to have a high blood pressure and in particular a high diastolic pressure (usually 150 mm. of mercury or more). Examination reveals enlargement of the heart and peripheral arteries and—what is most important—the fundus oculi shows, with or without the other signs of retinitis, *papillœdema*, usually bilateral. In advanced cases there may be some wasting and some anæmia, but often these signs are absent; and except for the cardiac and arterial enlargement there is no physical evidence of long-standing disease. Some degree of heart failure is however nearly always present; careful examination may reveal that the liver is slightly enlarged and tender and there may be a few moist sounds in the lungs, but unless heart failure is suspected the significance of these findings may be overlooked. Peripheral venous congestion and extensive œdema are only rarely seen.

The urine will probably contain a considerable amount of albumin and have a constantly low specific gravity in the neighbourhood of 1010. The blood will show marked nitrogen retention, with a blood-urea of 100 mg. or more. Renal function tests will show a moderate or marked impairment of concentrating power. Death with mixed renal and cardiac failure will occur six months to two years from the date of the first symptom.

At post-mortem the kidneys will show slight or only moderate contraction. On histological examination, in addition to the lesions of ischæmic atrophy, usually present in individuals who have had high blood pressure, focal glomerular lesions are found in the form of acute focal necroses (frequently leading to adhesions between capsule and tuft), fibrinoid

* The Schorstein lecture for 1937, delivered at the London Hospital on Oct. 21st.

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necrosis of individual capillary loops, proliferative glomerulitis (which is often focal, affecting a single lobule of a glomerular tuft), and varying degrees of proliferative capsulitis with occasional true crescent formation. The tubules show a severe albuminous degeneration and typical hyaline droplet degeneration is almost always present in occasional tubules. The interstitial tissue shows varying degrees of fibrosis and cellular infiltration. The vascular lesions are important and are very constantly present. There is an acute degeneration leading to necrosis of the walls of many small arterioles, particularly the afferent arterioles to glomeruli. The walls of the affected arterioles are enormously swollen, owing to the deposition of material which is dark purple in colour in sections stained with hæmatoxylin and eosin, the so-called fibrinoid necrosis (Figs. 3 and 4). This swelling of the wall leads to obliteration of the lumen, which often is apparently complete. There are in addition loss and fragmentation of nuclei, and frequently red blood-cells in the vessel walls; proliferative changes in and about the arterioles also occur. The smaller arteries up to the size of interlobulars also show an almost constant lesion in the form of so-called endarteritis fibrosa (Figs. 3, 4, and 5); this is a relatively richly cellular thickening of the intima, often leading to obliteration of the lumen and easily distinguishable from the intimal thickening, associated with increase of elastic tissue, found in all cases of hypertension (Fig. 6). *But these vascular lesions are not confined to the kidney.* Similar lesions of arterioles and small arteries are also found in other organs particularly the adrenals, pancreas, and intestine, more occasionally in liver, stomach, prostate, testicle, and elsewhere (Figs. 7 to 13).

Such then is the clinical and pathological picture of malignant hypertension in its fully developed state.

NATURAL HISTORY OF THE DISORDER

It is not surprising in view of the histological changes in the kidney I have just described, and the frequent occurrence of renal failure, that this condition has been regarded as an example of primary renal disease and has been classified as a chronic nephritis. Looking backward from the post-mortem examination of the fully developed case, it would be difficult to arrive at any other conclusion.

If, however, in place of this retrospect we direct our attention to the earlier stages of the disorder, a different sequence of events is manifest, and a closer approach to the true nature of malignant hypertension can be made. By such a study evidence is obtained, both clinical and histological, that involvement of the kidneys is slight or absent in the early stages but develops rapidly as the disease progresses. Let us take first the clinical evidence. It is not uncommon when the patient with malignant hypertension is first seen to find the concentrating power of the kidney well preserved, the blood-urea within normal limits, and the other tests of renal function satisfactory. Indeed in some patients albumin may be absent from the urine. Thus in this series of 40 fatal cases, in which the diagnosis was confirmed histologically, we have sufficient observations in the early stages to show that the specific gravity of the urine was greater than 1020 in 12, the blood-urea was less than 0·040 g. per 100 c.cm. in 10, and the renal function was within normal limits in 8. In 5 of the 40 patients albumin was reported as absent from the urine in the early stages of the illness, and in 3 instances we were able to verify this important point. Moreover, we have at present under observation, and therefore not included in this series, a number of patients in whom the clinical diagnosis of malignant hypertension has been made, but in whose urine albumin has not yet appeared.

The sequence of events which may follow in such cases is well illustrated by the accompanying Table, which records at three-monthly intervals the progress of the condition in one of our patients, a woman aged 32, with malignant hypertension in association with Cushing's syndrome (pituitary basophilism).

DETERIORATION OF RENAL FUNCTION IN A WOMAN OF 32 WITH MALIGNANT HYPERTENSION AND CUSHING'S SYNDROME

Date.	B.p.	Papill-œdema.	Urine albumin.	Renal function.			
				Blood-urea mg. %.	P.S.P. 2 hrs.	Urea Concn. %.	Urea Clrnce. %.
Jan., 1936.	210/140	Nil.	Nil.	33	74	2·8	94
April, 1936.	210/140	Slight.	Cloud.	37	65	2·6	79
Sept., 1936.	210/150	Present.	1/12 vol.	48	49	2·3	46
Jan., 1937 (died).	180/140	Severe.	1/8 vol.	177	Trace.	0·7	5

B.p. = blood pressure.
P.S.P. = phenolsulphonphthalein.

When she was first seen in November, 1935, the blood pressure was 200/90; there was no papillœdema, and no evidence of renal involvement. In January, 1936, the findings were the same; the blood pressure was 210/140, papillœdema was absent, urine albumin was absent, the blood-urea was 33 mg. per 100 c.cm., the phenolsulphonphthalein excretion was 74 per cent. in two hours, the concentration of urea in the urine was 2·8 per cent., and the urea-clearance test of Van Slyke was 94 per cent. of normal.

In April, 1936, the blood pressure was still 210/140, but now there was slight papillœdema, the urine contained a cloud of albumin, the blood-urea was 37 mg., the phenolsulphonphthalein excretion was 65 per cent. in two hours, the concentration of urea in the urine was 2·6 per cent., and the urea-clearance 79. In September, 1936, the blood pressure was 210/150, papillœdema was now well marked, the urine contained one-twelfth volume of albumin, nitrogen retention was beginning (the blood-urea being 48 mg.), the phenolsulphonphthalein excretion was 48 per cent. in two hours, the concentration of urea in the urine was 2·3 per cent., and the urea-clearance was 46.

In January, 1937, the blood pressure was 180/140 and definite signs of cardiac failure were present; the papillœdema was now severe, with other signs of retinitis; the urine contained one-eighth volume of albumin, the blood-urea was 177 mg., the phenol-sulphonphthalein excretion was reduced to a trace in two hours, the concentration of urea in the urine was 0·7, and the urea-clearance 5. Death occurred on Jan. 18th, 1937.

This patient aptly illustrates the absence of all evidence of renal involvement in the earlier stages of the disorder and the rapid downhill progress following the appearance of papillœdema.

The pathological evidence was obtained from patients who died from non-renal causes such as cerebral or subarachnoid hæmorrhage, or cardiac infarction or failure. We have 10 such cases in which the histological picture shows the early stage of renal involvement. In these instances, except for ischæmic atrophy, which is present in varying degree in the kidneys of all patients with prolonged hypertension, the renal lesions are comparatively slight, and sometimes only careful search will reveal them.

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Even in these cases, however, acute necrotic lesions of the arterioles can be found in organs other than the kidneys.

I should like to record the histological findings in one such case by way of illustration.

The patient, a male aged 47, with a blood pressure of 200/130 and severe bilateral papillœdema, had a bilateral subtemporal decompression performed for the relief of high intracranial pressure. He died shortly after operation from left-sided heart failure.

At post-mortem examination the kidneys appeared normal for a patient of this age. On histological examination, except for moderate ischæmic atrophy, the kidney at first sight seemed to be normal (Fig. 14). On close search, however, a few glomeruli showing focal necrosis, with and without adhesions, were found. No glomerular lesions other than these were seen. The tubules showed no dilatation; they were well preserved except in the areas of ischæmic atrophy. There was slight albuminous degeneration, but no fatty or hyaline droplet degeneration was seen. The interstitial tissue was unaltered except in the areas of ischæmic atrophy where the usual appearances were present. The vessels showed acute necrosis of only very occasional afferent arterioles (Fig. 15).

In spite of these slight changes in the kidney widespread vascular lesions were present in other organs; the intestine, adrenals, pancreas, prostate, and testicle showed typical acute necrosis of arterioles and small arteries (Figs. 16 and 17).

We feel therefore that the natural history of this disorder, as revealed both by the progress of the condition during life and by the pathological findings in the various stages, is that of a progressive circulatory or vascular disorder in which the involvement of the kidneys is a secondary and relatively late manifestation.

Let us turn now to a consideration of some points in the diagnosis, prognosis, and treatment of this condition.

DIAGNOSIS

The conditions from which malignant hypertension must be separated are chronic diffuse nephritis with hypertension on the one hand, and benign hypertension on the other. Because of the frequency of headache, vomiting, and papillœdema in malignant hypertension the question of cerebral tumour also sometimes arises.

The differentiation from chronic diffuse nephritis may be difficult if patients with malignant hypertension are not seen until the terminal stage of their illness, for the end stage of malignant hypertension and chronic diffuse nephritis may present the same picture—that is, wasting, anæmia, and renal failure, associated with high blood pressure and papillœdema. If, however, the cases are seen in the earlier stages, no difficulty usually arises; for in patients with malignant hypertension papillœdema is constantly present and appears before renal failure develops, whereas in chronic diffuse nephritis papillœdema is usually absent at this stage, and when it does appear renal failure is already well established. Though both conditions end with renal failure, this failure in chronic diffuse nephritis is insidious and slowly progressive, whereas in malignant hypertension it develops rapidly as a terminal phenomenon.

The histological differentiation of malignant hypertension from chronic nephritis is dependent on the focal distribution of the glomerular lesions in malignant hypertension, the less extensive destruction of renal tissue which is found, and the presence of acute arteriolar lesions outside the kidney in pancreas, suprarenals, intestines, &c. In chronic nephritis the glomerular lesions are more diffuse, the renal destruction greater, and acute arteriolar lesions, though they may occur in the kidney, are extremely rare in other organs.

The differentiation of malignant hypertension from benign hypertension seldom gives rise to difficulty. The presence or absence of *papillœdema* is the guiding factor. Papillœdema is the most important sign of malignant hypertension and is almost invariably present when symptoms first appear. If we see a relatively young patient with a diastolic pressure of 140 mm. of mercury or more, and no sign of renal involvement, the age of the patient and the high diastolic pressure may tempt us to suspect the early stage of malignant hypertension; but if papillœdema is absent, this diagnosis should never be made. The case should be regarded as one of benign hypertension until papillœdema can be detected.

I have emphasised the gravity of papillœdema as evidence of the malignant type of essential hypertension, and it should be realised that the other signs of retinitis (hæmorrhages and exudate), though nearly always present in malignant hypertension, have not the same significance. Retinal hæmorrhages are not uncommon in benign hypertension, and extensive exudates are occasionally seen, especially in elderly patients with diabetes. In the absence of papillœdema the course even in these patients is benign.

The histological differentiation of malignant hypertension from benign hypertension presents no difficulties, for in benign hypertension acute glomerular lesions are absent and the acute arteriolar necrosis and "endarteritis fibrosa" always found in malignant hypertension do not occur.

Cerebral tumour is occasionally suspected in patients with malignant hypertension. The absence of localising signs, the high level of the blood pressure and the cardiovascular hypertrophy, with albumin in the urine, will differentiate the two conditions. Once the possibility of this error is realised there will seldom be any difficulty.

PROGNOSIS

The prognosis in malignant hypertension is extremely grave. In this series of 40 patients the longest time between the first appearance of symptoms and death was five years and the shortest four weeks, while the average duration from first symptom to death was only one year. In only 5 cases did the total duration exceed two years.

This is in striking contrast to the outlook in benign hypertension, in which life and relatively good health are usually maintained for many years. Patients with benign hypertension not infrequently live ten, fifteen, or even twenty years after their hypertension is discovered. During this period their activity may be little limited and death when it comes may be due to some quite extraneous cause. There is little doubt that the failure to differentiate the malignant form of hypertension from the benign has been in large part responsible for the far too gloomy outlook of our profession on hypertension in general.

TREATMENT

The treatment of malignant hypertension is the treatment of heart failure, for some degree of heart failure is present in every case. In addition treatment may have to be directed to the relief of symptoms due to increased intracranial pressure which is also present in all these patients.

The type of heart failure is always the same. It is the type characterised by pulmonary congestion and pulmonary œdema which we recognise as failure of

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the left side of the heart. Its main manifestations are attacks of nocturnal breathlessness or "cardiac asthma," due to pulmonary congestion, and acute pulmonary œdema which is not infrequently the cause of death. Peripheral venous congestion and œdema, the signs of failure of the right side of the heart, are usually slight and may be absent, even when death from heart failure is threatened.

Attacks of pulmonary congestion are apt to come on suddenly and the resulting symptoms are severe and alarming. Emergency treatment may therefore be required. In less severe attacks a period of rest in bed and the administration of digitalis will often reduce their frequency and severity. In more severe attacks of pulmonary congestion, with threatening pulmonary œdema, venesection, and the administration of morphia often give dramatic relief.

The treatment of symptoms due to increased intracranial pressure, in patients with malignant hypertension, is less satisfactory. The attacks of morning headache and vomiting are difficult to control. Aspirin and similar analgesics give some relief but symptomatic treatment is far from successful. If the attacks are frequent and very severe, active attempts to lower intracranial pressure by lumbar puncture and hypertonic intravenous or rectal injections may be tried. If hypertensive cerebral attacks with convulsions and temporary paralyses occur, venesection and the administration of morphia in addition to the above-mentioned measures are indicated. The terminal stage of the illness is often most distressing and in view of the invariably fatal termination morphia should not be withheld.

CONCLUSION

In this lecture I have attempted to give the results of a combined clinical and pathological study, extending over many years, of the condition we recognise as malignant hypertension. We believe this condition to be a generalised, or at least widely spread vascular disorder occurring in patients with a primary hypertension. The cause of this primary hypertension is quite unknown, but we do not think it is attributable to the lesions found in the kidney at death, for the evidence which has been presented leads inevitably to the conclusion that involvement of the kidney is a late, even terminal, manifestation of the disorder. We therefore regard the lesions in the kidney—in the capillaries of the glomeruli as well as in the arterioles and small arteries—as a part of the widespread vascular disorder characteristic of this type of hypertension, and comparable with the vascular lesions in other organs.

The *differentiation* of malignant hypertension and certain cases of chronic diffuse nephritis may be difficult in the later stages when renal failure is fully developed, but if the patients are seen soon after the onset of symptoms it should be easy.

The *prognosis* in malignant hypertension is very grave, death usually occurring within one year of the appearance of the first symptom; it is in striking contrast to the relatively good prognosis in benign hypertension.

The *treatment* is essentially the treatment of failure of the left side of the heart, which is invariably present in some degree.

In regard to *classification*, we feel that the completely meaningless term, chronic interstitial nephritis, should be discarded. There are two main groups of patients with hypertension: those with chronic diffuse nephritis on the one hand, and those with essential hypertension on the other. Essential hypertension is however not a single entity. It must be separated into two forms, malignant and benign; these must be sharply differentiated, the presence or absence of papillœdema being the guiding factor. The term hyperpiesia, if used, should be reserved for the common benign form in which papillœdema is absent.

I am convinced that the recognition of this form of Bright's disease as a distinct clinical and pathological entity is of great help in clearing the confusion which has become traditional in this branch of medicine; even more we have reason to hope that an understanding of the natural history of this disorder will throw new light on the pathogenesis of inflammatory lesions in the kidney in general.

In conclusion I should like to express my very real gratitude to Prof. Turnbull who has so generously given me the use of his material. I should like also to thank the physicians of the London Hospital, who have one and all given me access to their patients.

PROF. ELLIS: DESCRIPTIONS OF ILLUSTRATIONS ON PLATE

FIG. 1.—Kidney. Malignant hypertension in relatively early stage. Majority of glomeruli normal. (Hæmatoxylin and eosin, ×40.)

FIG. 2.—Kidney. Malignant hypertension in the late stage with renal failure. (Hæmatoxylin and eosin, ×40.)

FIG. 3.—Kidney. Malignant hypertension showing acute necrosis of afferent arterioles to two glomeruli, and "endarteritis fibrosa" of two small arteries. (Hæmatoxylin and eosin, ×110.)

FIG. 4.—Kidney. Malignant hypertension, acute necrosis of afferent arteriole and "endarteritis fibrosa" of interlobular artery. (Hæmatoxylin and eosin, ×135.)

FIG. 5.—Kidney. Malignant hypertension. "Endarteritis fibrosa" of interlobular artery showing cellular intimal thickening between endothelium and elastica interna. (Weigert's elastic stain, ×98.)

FIG. 6.—Kidney. Benign hypertension: "elastosis" of interlobular artery showing intimal thickening with great increase of elastic tissue in contrast to endarteritis fibrosa. (Weigert's elastic stain, ×98.)

FIG. 7.—Pancreas. Malignant hypertension showing acute necrosis of arterioles. (Hæmatoxylin and eosin, ×72.)

FIG. 8.—Adrenal. Malignant hypertension. Acute necrosis of arteriole, with great dilatation and swelling of the wall. (Hæmatoxylin and eosin, ×68.)

FIG. 9.—Intestine. Malignant hypertension. Acute necrosis of small arteries with aneurysmal dilatation. (Hæmatoxylin and eosin, ×142.)

FIG. 10.—Intestine. Malignant hypertension showing small artery with great narrowing of its lumen due to the deposition of fibrinoid material between the internal elastic lamina and the endothelium. (Weigert's elastic stain, ×700.)

FIG. 11.—Appendix. Malignant hypertension, acute necrosis of arterioles. (Hæmatoxylin and eosin, ×110.)

FIG. 12.—Retina and choroid. Malignant hypertension, acute necrosis of small arteries in choroid. (Hæmatoxylin and eosin, ×44.)

FIG. 13.—Brain. Malignant hypertension showing acute necrosis of arteriole. (Hæmatoxylin and eosin, ×300.)

FIG. 14.—Kidney. Malignant hypertension. Case described in text. (Hæmatoxylin and eosin, ×44.)

FIG. 15.—Kidney of same patient, showing acute necrosis of interlobular artery and afferent arteriole. (Hæmatoxylin and eosin, ×110.)

FIG. 16.—Pancreas of same patient, showing acute necrosis of small artery. (Hæmatoxylin and eosin, ×155.)

FIG. 17.—Adrenal of same patient, showing acute necrosis of arterioles. (Hæmatoxylin and eosin, ×110.)

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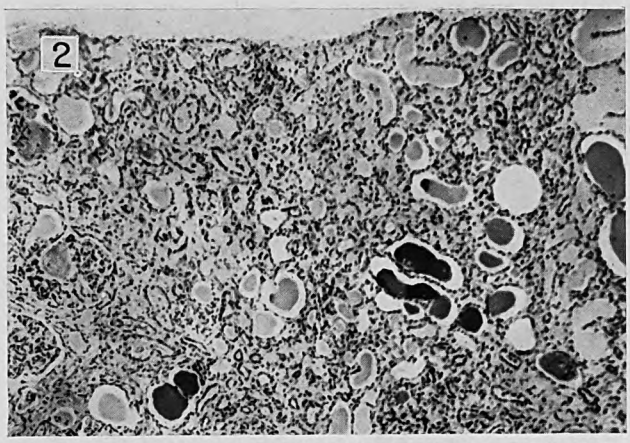
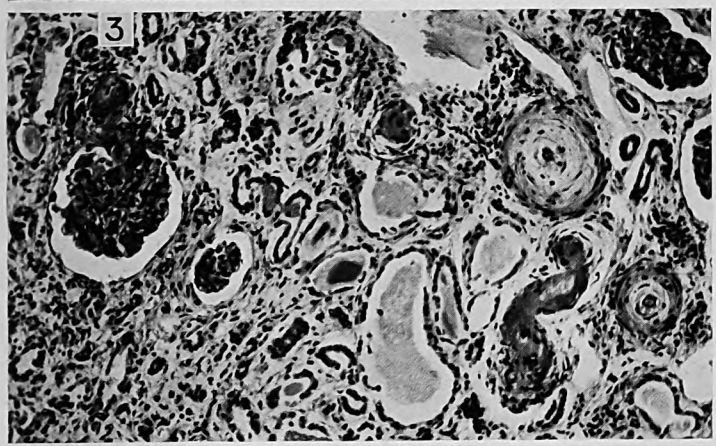
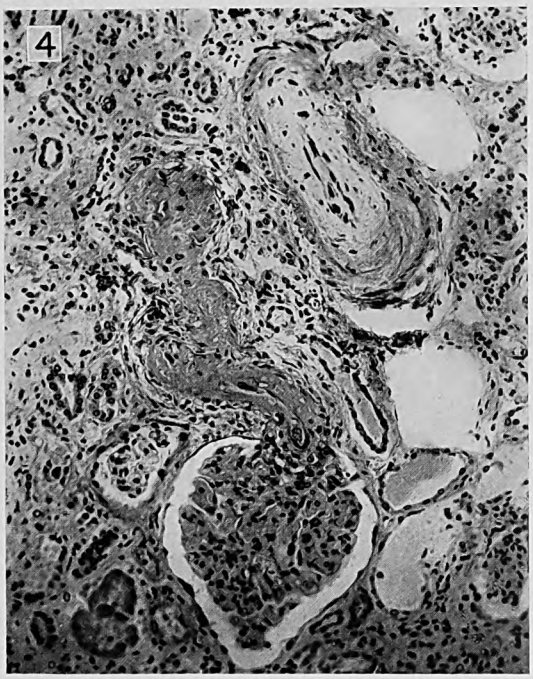
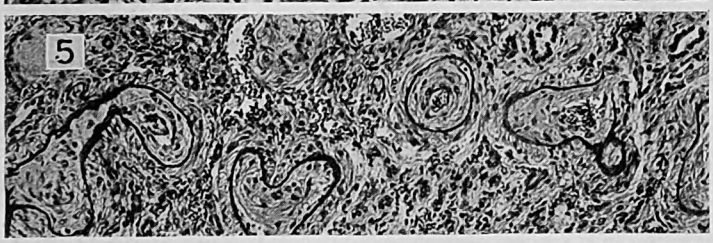
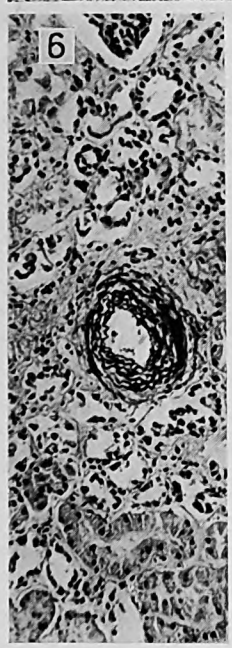
PROF. ELLIS : MALIGNANT HYPERTENSION

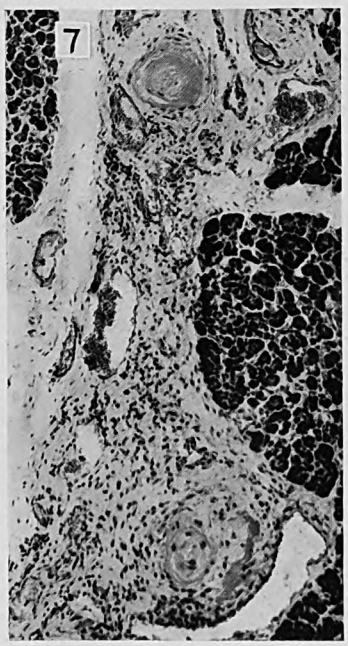


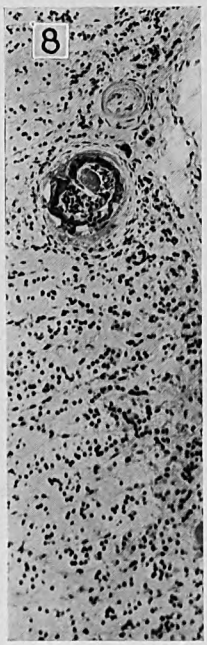












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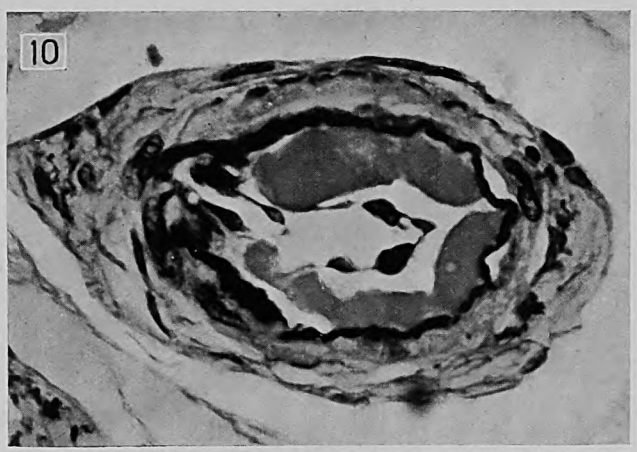
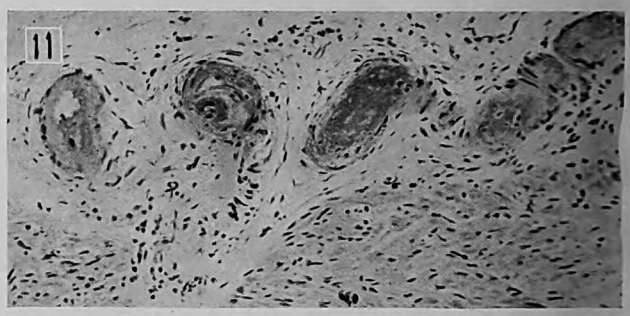
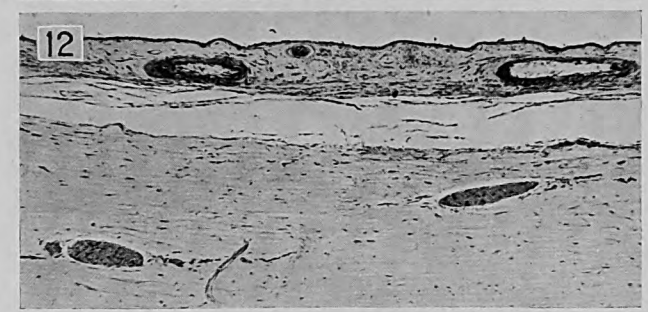
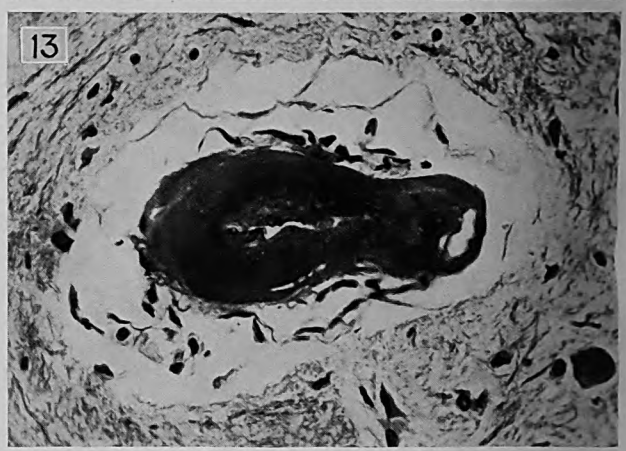
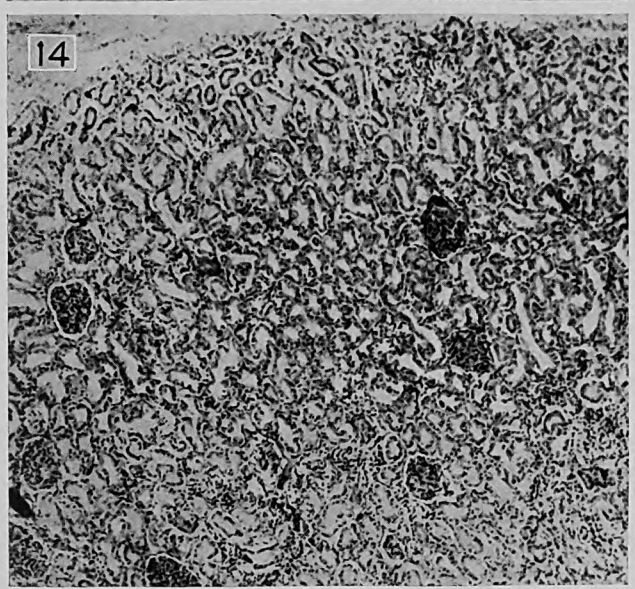
PROF. ELLIS : MALIGNANT HYPERTENSION

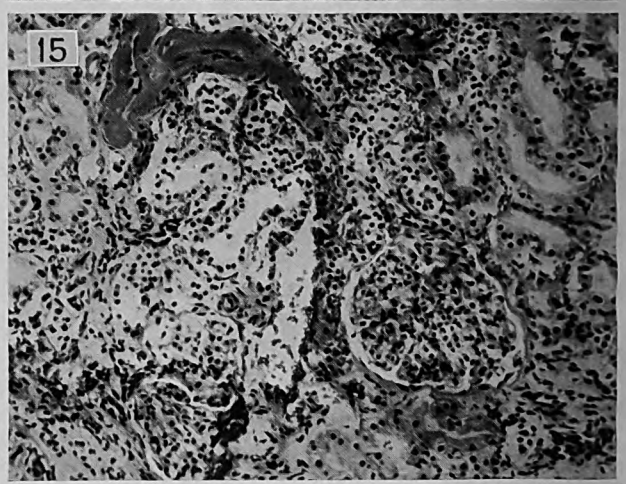


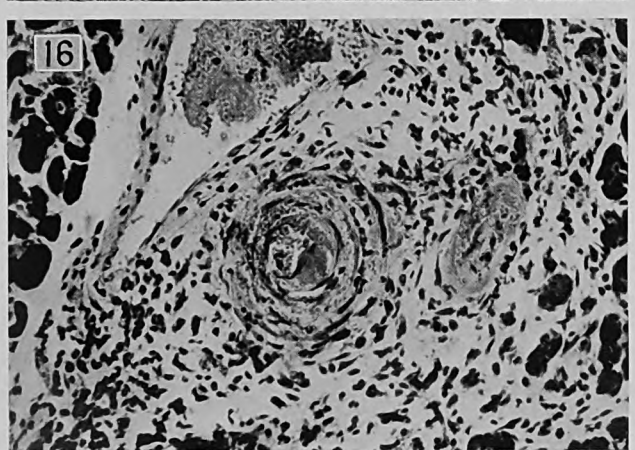


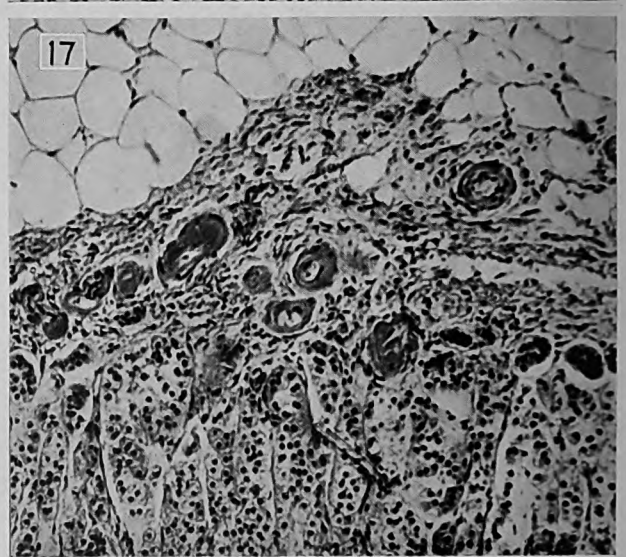












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SOME DEFICIENCIES OF NUTRITION AND THEIR RELATION TO DISEASE *

By CHARLES C. UNGLEY, M.D. Durh., F.R.C.P. Lond.

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III—NUTRITION AND THE NERVOUS SYSTEM: WITH SPECIAL REFERENCE TO POLYNEURITIS AND SUBACUTE COMBINED DEGENERATION OF THE CORD

FORTY-ONE years ago Christiaan Eijkman reported classical experiments which showed that deficient nutrition could give rise to degenerative lesions in the peripheral nerves. After much controversy it now seems clear that both beri-beri in man and experimental beri-beri in animals can adequately be explained on the basis of a B_1-avitaminosis (see Cowgill 1934).

Deficient intake of vitamin B_1 is the chief cause of beri-beri in rice-eating communities, although gastro-intestinal disturbances and infections sometimes accentuate the deficiency. In temperate climates beri-beri has followed drastic restriction of diet due to "indigestion," vegetarianism, "slimming," and food fads, but of particular interest is the possibility that polyneuritis associated with alcoholism, pregnancy, and gastro-intestinal disorders may be due to vitamin-B_1 deficiency. Lettsom (1786), in giving us the first description of alcoholic polyneuritis, drew attention to the frequency of gastro-intestinal disturbances and distaste for food, but regarded the polyneuritis as a direct neurotoxic effect of alcohol. Shattuck (1928) was probably the first to suggest that "alcoholic" polyneuritis was caused by failure to take or to assimilate food containing sufficient vitamin B (see also Wechsler 1930 and 1933, Minot, Strauss, and Cobb 1933, Villaret et al. 1936a and b). Jolliffe, Colbert, and Joffe (1936) found in alcohol addicts a definite correlation between the adequacy or inadequacy of vitamin-B_1 intake and the presence or absence of polyneuritis. The rate of improvement in the polyneuritis under treatment varied with the amount of vitamin B_1 administered (Jolliffe and Colbert 1936). Strauss (1935) gave 1–2 pints of whisky daily along with large amounts of vitamin B_1 and other food factors to ten patients with "alcoholic" polyneuritis; the polyneuritis improved in every instance.

It is clear that in some cases at least the polyneuritis is not the direct result of alcohol per se and "may properly be regarded as beri-beri."† Deficient intake of vitamin B_1 results from neglect, anorexia, nausea, and sometimes vomiting. Requirements are increased by the high caloric value of the alcohol, which acts as a pure carbohydrate. At the same time absorption is impaired by an abnormal state of the gastro-intestinal tract brought about by the direct action of alcohol on the mucous membranes and its destructive effect on alimentary enzymes (Blotner 1936). By a vicious circle, the resulting state of sub-nutrition adversely affects gastro-intestinal function and may be the cause of achlorhydria (Joffe and Jolliffe 1937). Infections such as tuberculosis which increase the utilisation of vitamin B_1 may render a latent deficiency manifest.

Alcoholic polyneuritis is rare in the north of England and I have encountered only two cases in recent years. The vitamin B_1: calorie ratio of the diet had been low, taking into account the caloric value of the alcohol ingested, and vitamin B_1 in the urine was subnormal in amount. Schopfer's test for vitamin B_1 applied to the blood in one instance gave a low value (5 μg. per 100 c.cm.).

POLYNEURITIS OF PREGNANCY

Clinical and pathological resemblances between gestational polyneuritis and beri-beri have been noted by Wechsler (1933) and others. Factors giving rise to deficiency include: nausea affecting food intake; persistent vomiting, which is usually a feature (Berkwitz and Lufkin 1932); the use of carbohydrate-rich foods poor in vitamin B_1; increased requirements for vitamin B_1 due to raised metabolism and fœtal demands; and possibly poor assimilation due to low gastric acidity (Strauss and Castle 1932). Few cases recover during gestation when treated on conventional lines, but supplements of vitamin B_1 and other food factors are almost always effective (Strauss and McDonald 1933; see also Fouts et al. 1934, Sze 1934, Vorhaus et al. 1935, Theobald 1936).

In the following case the development of polyneuritis was delayed until after parturition.

A woman, aged 22, had intractable vomiting during her second pregnancy, which ceased after spontaneous abortion at the end of the fourth month. Ten days later she lost the use of her arms and legs and soon became completely helpless, with extensive wasting, loss of tendon-jerks, and sensory loss; cerebro-spinal fluid normal; gastric hypochlorhydria. There was tachycardia and the intravenous injection of adrenaline caused a marked drop in diastolic blood pressure.

Even before pregnancy the patient's diet had contained only about 230 I.U. of vitamin B_1 per day. Schopfer's test for vitamin B_1, applied to the blood after spontaneous clinical improvement had set in, gave a value of 7 μg. per 100 c.cm. which is not particularly low. The urinary excretion of vitamin B_1, however, was very poor and there was no response to a test dose.

Fig. 1 shows the various forms of treatment tried and the progress of changes in the clinical condition. Pregnancy had terminated and spontaneous improvement in the neurological condition had already commenced when treatment was started. Vitamin B_1 seemed to bring about a more rapid gain in weight and perhaps in the rate of growth of finger-nails. The rate of neurological improvement on the other hand did not alter much. It is possible that the "biochemical lesion" was healed shortly after pregnancy terminated and vomiting ceased, and that the rate of neurological improvement thereafter depended on the rate of regeneration of new nerve-fibres in the peripheral nerves; being hastened little or not at all by the successive therapeutic measures employed.

POLYNEURITIS ACCOMPANYING LESIONS OF THE ALIMENTARY TRACT

The rôle of lesions of the alimentary tract in the production of deficiency was discussed in Lect. I. I then referred to a case in which beri-beri resulted from dietary restriction for gastric ulcer. The patient was a sea-going fitter, aged 37, on a voyage to the Far East. Digestive symptoms and unpalatable food caused him to limit his diet to rice and soup. Following an attack of diarrhœa and vomiting he developed

* The Goulstonian lectures for 1938, delivered before the Royal College of Physicians of London on March 3rd, 8th, and 10th. Lects. I and II appeared in our last two issues.

† It is by no means certain, however, that *all* varieties of "alcoholic" neuritis are due to vitamin-B_1 deficiency. Evidence that long-continued or often-repeated subjection to alcohol poisoning may be a direct cause of neuritis is contained in recent work which showed that tadpoles subjected to the influence of low concentrations of alcohol developed degeneration of the peripheral nerves, which could be observed microscopically during life (Speidel 1936).

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generalised œdema and paralysis. A year after recovering from beri-beri epigastric pain recurred; examination showed a gastric ulcer, hypochlorhydria, and an excess of mucus. Vitamin-B_1 excretion was poor, suggesting low reserves.

Polyneuritis also occurred in a crane driver, aged 52, who following treatment in hospital for gastric ulcer kept to a restricted diet without recurrence of digestive symptoms.

After a year he developed numbness and weakness of the limbs, and later extensive paralysis, wasting, and sensory loss in the extremities. The cerebrospinal fluid was normal except for a slight increase in protein (0·06 per cent.). Examination showed tachycardia; increased capillary fragility, and hypochlorhydria. Vitamin-B_1 excretion was somewhat poor but the findings did not indicate a very severe degree of deficiency (see Lect. I, Fig. 5). The polyneuritis progressed during a control period and slowly improved during vitamin-B_1 therapy. But even when the dose of vitamin by mouth and by injection was increased to 50 mg. (25,000 units) a day, there was no *dramatic* response, and a causal relationship to vitamin-B_1 deficiency was not conclusively established.

Gastric achlorhydria is thought to favour the development of beri-beri, particularly when the diet is restricted (Cowgill 1934). I shall describe later a case of polyneuritis following prolonged vomiting and diarrhœa in a patient with pernicious anæmia.

Deficient nutrition may account for the "cachectic" polyneuritis occasionally encountered in cancer (Shattuck 1928, Minot 1929, Wechsler 1933, Perkins 1936), and for the polyneuritis secondary to pyloric stenosis described by French authors (see Strauss 1938). I have recently seen polyneuritis, confirmed pathologically, in a miner, aged 47, with pyloric stenosis.

For two years his diet had been limited because of gastric pain and poor teeth, the vitamin-B_1 intake being about 275 I.U. daily. He seldom vomited. There was extreme pyloric stenosis and high acidity, and a simple ulcer was suspected. He had pain, tenderness, and weakness of the legs, paralysis being greatest in the peronei and extensors of the toes. Deep reflexes were absent and sensory phenomena were prominent (Fig. 2). These findings were unchanged after electrical treatment and massage for five weeks. Thereafter vitamin-B_1 injections led to slow but definite improvement. Operation revealed a small scirrhous pyloric carcinoma. The presence of degenerative lesions in the peripheral nerves was confirmed at autopsy a week later. With Schopfer's test the blood showed a low content of vitamin B_1

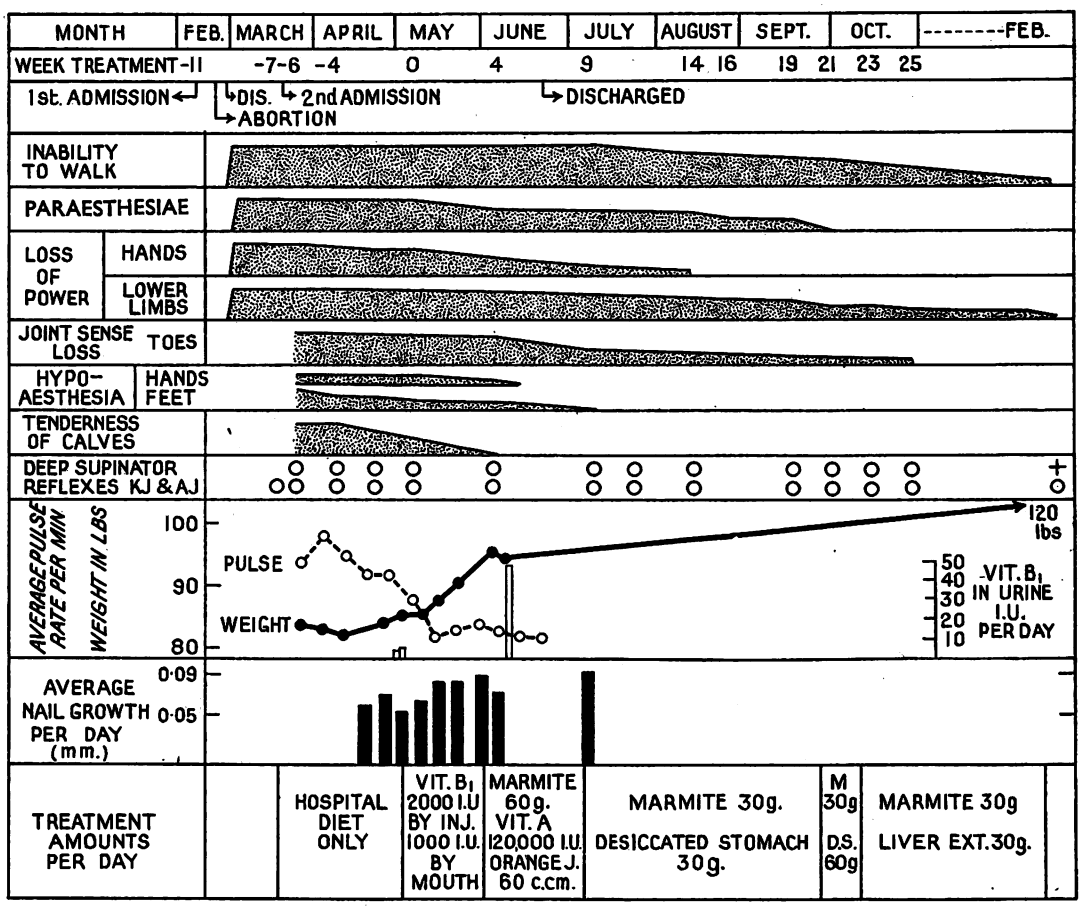

FIG. 1.—Diagrammatic representation of the progress of a case of polyneuritis which followed hyperemesis gravidarum (see text).

U.E. = upper extremities.
L.E. = lower extremities.
INCOORD. = incoördination.
R., L. = right, left.
K.J., A.J. = knee-jerks, ankle-jerks.
+ = normal, + + = exaggerated.

SL. = slight, 0 = absent.

↑ = extensor, ↓ = flexor.

OUTER, INNER: plantar response obtainable on stroking outer or inner sides of sole of foot.

R.W., L.W. = right wrist, left wrist recovering.
(B) = able to feed self (hold bread).
R : N = right : normal.
I.U. = international units.
R.B.C. = red blood-cells.
HB. = hæmoglobin.

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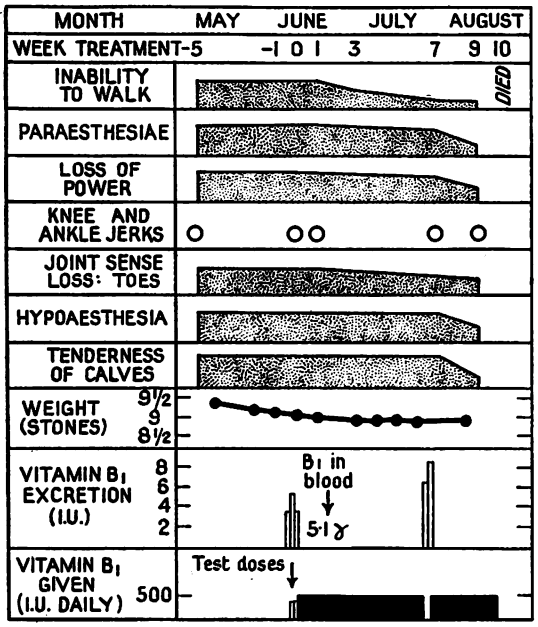

FIG. 2.—Polyneuritis associated with pyloric stenosis, showing the effect of injections of vitamin B_1.

(5·1 μg. per 100 c.cm.). Urinary excretion tests demonstrated that the stores of vitamin B_1 were severely depleted and it is possible that larger doses of the vitamin would have produced a more rapid effect on the neurological symptoms.

Polyneuritis complicating chronic intestinal disorders such as ulcerative colitis (Jones 1933) and cœliac disease (Haas 1929) is probably the result of dietary deficiency and impaired absorption. In the following case polyneuritis was a sequel to faulty gastro-enterostomy (cf. Urmy et al. 1934).

A cycle-maker, aged 54, had gastro-enterostomy for gastric ulcer in November, 1935. Gastric symptoms ceased, but he lost weight and the limbs became weak and numb. Examination in April showed sensory loss, weakness, and wasting in upper and lower limbs with absent tendon-jerks; amnesia, disorientation, and depression; aphonia; cerebro-spinal fluid normal except for slightly increased protein. Also tachycardia, numerous extrasystoles, and sometimes auricular fibrillation; thickened radial arteries, blood pressure 120/90, little cardiac enlargement; achlorhydria. Food leaving by the pylorus re-entered the stomach by the gastro-enterostomy stoma leading to a "circus movement" with gross stasis and bacterial proliferation. Vitamin-B_1 intake had been poor (about 145 I.U. daily) and excretion in the urine was extremely low. The neurological condition was unchanged during five weeks' control period on a diet low in vitamin B_1. After injections of 500 I.U. of vitamin B_1 daily for three months he gained 5 lb., improved mentally and could walk alone, but the physical signs altered little (Fig. 3). With 1000 I.U. daily he gained 21 lb. in seven weeks with more rapid improvement in walking, memory, and sensation. He died at home from sudden heart failure a month later.

On the whole the evidence available justifies the belief that polyneuritis associated with alcoholism, pregnancy, and gastro-intestinal lesions is due, in some cases at least, to nutritional deficiency. Ætiological factors are low intake, poor assimilation, and increased utilisation of vitamin B_1. According to Strauss (1936) the neurological manifestations do not differ from beri-beri either clinically or pathologically. The cases described were characterised by sensory as well as motor involvement; a fairly symmetrical distribution, affecting most the distal parts of the extremities; and little or no increase of protein in the cerebro-spinal fluid. There were mental symptoms in some instances. Cardiovascular symptoms were common (see Weiss and Wilkins 1937). Other signs of nutritional deficiency were frequent. Low values for vitamin B_1 have been found in the blood in alcoholic polyneuritis and polyneuritis secondary to pyloric stenosis, and a moderate value in a case of polyneuritis of pregnancy undergoing spontaneous recovery. The excretion of vitamin B_1 in the urine was low in all cases, and the response to test doses was slight or delayed (see Figs. 1, 2, and 3; and Fig. 5, Lect. I, and Harris, Leong, and Ungley 1938). A response to vitamin-B_1 therapy after a control period without improvement was observed in some cases, but the effects were not dramatic. Dosage, by present standards, was not always adequate, but even with 30–50 mg. daily and a supply of other food factors improvement was sometimes slow, due perhaps to the time required for regeneration in

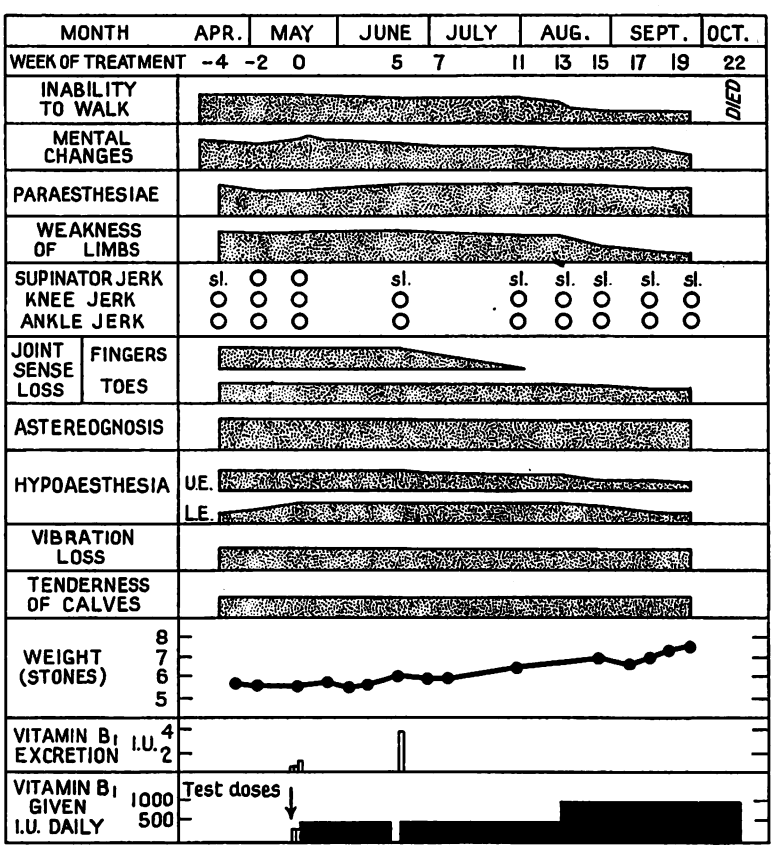

FIG. 3.—To illustrate the effect of vitamin B_1 injections in a case of polyneuritis which followed faulty gastro-enterostomy

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severely damaged neurones. The possible rôle of deficiency of other food factors, particularly vitamin A (see Mellanby 1934), needs further consideration.

OTHER TYPES OF POLYNEURITIS

Is there any evidence that nutritional deficiency plays a part in types of polyneuritis other than those already discussed? Long febrile illnesses are sometimes followed by polyneuritis, perhaps as a result of deficient intake, increased katabolism, and possibly poor assimilation of vitamin B_1.

Some have regarded diabetic neuritis as the result of vitamin-B_1 deficiency (see e.g., Vorhaus, Williams, and Waterman 1935). It is argued that the motor or paralytic form of diabetic neuritis is uncommon under 40, whereas the most severe forms of diabetes occur before that age. Diabetes commencing after 40 is often preceded by obesity and an excessive intake of highly milled cereals poor in vitamin B_1. Disordered carbohydrate metabolism and tissue wasting are thought to increase the need for the vitamin, while achlorhydria, which is not infrequent, would perhaps impair its assimilation. But a beriberi-like state in diabetes is very rarely observed (Wohl 1926), and ordinary diabetic "neuritis" does not resemble beri-beri either clinically or pathologically. Two recently observed cases were men 66 and 68 years old. Neither had diabetes severely. Pulmonary tuberculosis (afebrile) was a complication and both had hardened radial arteries. One had hypertension, severe generalised polyneuritis with wrist-drop and involvement of the shoulder-girdle, but no sensory phenomena. The other had paræsthesiæ, hypoæsthesia, leg weakness, and loss of knee- and ankle-jerks. Protein in the cerebro-spinal fluid was considerably increased. Neither patient had achlorhydria. The vitamin-B_1 intake in one case was good, and vitamin-B_1 excretion was normal. The other patient had taken a poor diet and showed low urinary values for vitamin B_1. Vitamin B_1 in the blood according to Schopfer's method was normal in each case. Evidence so far available does not seem to justify the inclusion of diabetic "neuritis" amongst the forms of polyneuritis due to vitamin-B_1 deficiency.

I have also investigated other cases of polyneuritis which, on clinical grounds, were classified as probably not of nutritional origin: lead palsy, diphtheritic, "acute infective," "chronic progressive" types, and others of unknown causation. Sensory phenomena were usually slight or absent. The cerebro-spinal fluid protein was often raised. Signs of nutritional deficiency were not usually present. Some excreted as much vitamin B_1 as controls of the same social status; others showed poor excretion. It must be remembered that while "normal" figures for urinary excretion are strong evidence against the existence of vitamin-B_1 deficiency, low figures afford no justification in themselves for concluding that the disease

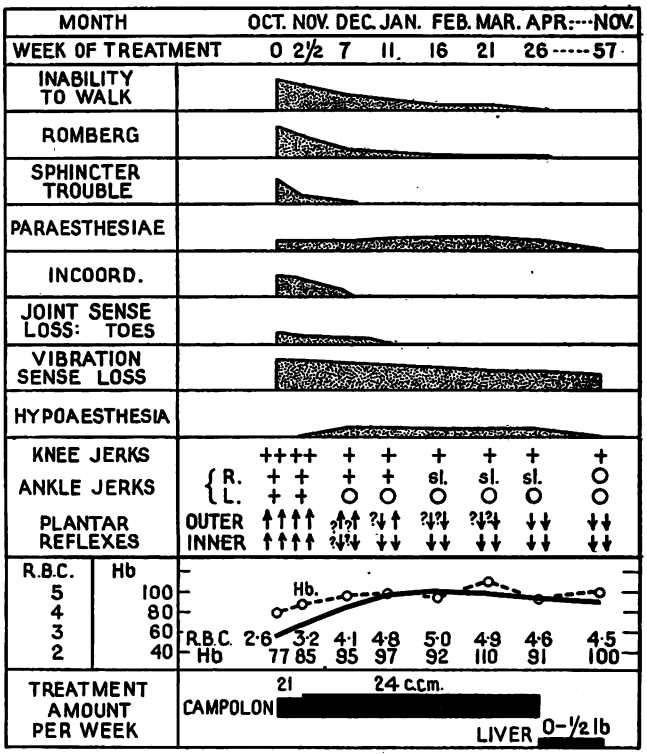

FIG. 5.—A case of pernicious anæmia and subacute combined degeneration of the cord, to illustrate the effect of parenteral liver therapy on the neurological symptoms and signs.

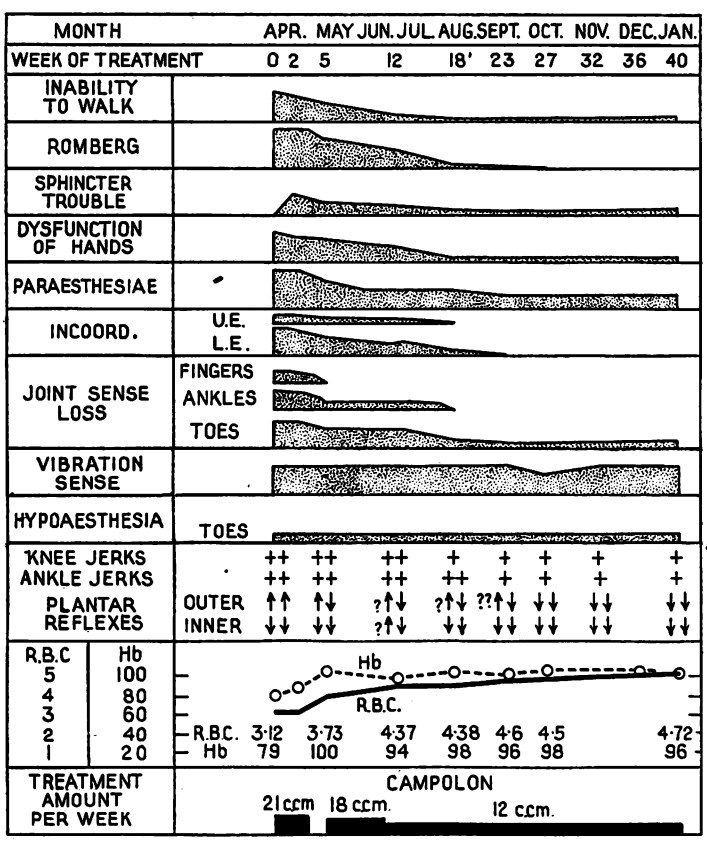

FIG. 4.—Changes in the neurological condition in a patient with pernicious anæmia and subacute combined degeneration during treatment with liver extract intramuscularly.

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from which the patient suffers is necessarily the result of vitamin-lack. None of the cases tested had deficiency of vitamin B_1 in the blood by Schopfer's method. Therapeutic tests were sometimes difficult to assess because of a tendency to spontaneous remission, but for the most part vitamin B_1 appeared to be without influence on these forms of polyneuritis. Clearly, however, much more work needs to be done before the rôle of nutritional deficiency in the various types of polyneuritis can be assessed.

Subacute Combined Degeneration of the Cord

It is probable that subacute combined degeneration, like pernicious anæmia, is the result of a nutritional deficiency based on a gastric defect. Minot and Murphy (1926) observed that liver sometimes caused improvement in paræsthesiæ and coördination but attributed it to improvement in the general condition. A follow-up of a large series of cases of subacute combined degeneration in 1929 led us to believe that liver had a direct effect on the neurological manifestations (Ungley and Suzman 1929). It is probable that more potent material is required to arrest the progress of lesions in the nervous system than to supply the needs of blood formation. With orally administered material failures were not infrequent, partly due to the difficulty of maintaining a sufficiently high intake. The beneficial effects of liver therapy on the nervous lesions have been more readily demonstrable since injectable liver extracts became available. Results obtained with Campolon and Pernæmon forte in thirty-one cases of subacute combined degeneration of the cord were summarised in 1935 (Ungley and Nattrass). Improvement was closely related to the duration of symptoms. Eighteen cases with difficulty in walking for 1 year or less improved, however severe the paraplegia, whereas six cases with an average duration of 5 years showed little or no change. Factors such as age and initial degree of anæmia were of relatively little importance. In cases of short duration (under 2 years) the results were equally good in patients with signs referable chiefly to the posterior columns, in those with pyramidal signs predominant, and in those with marked involvement of both posterior and lateral columns. Patients with severe paraplegia and incontinence of urine sometimes recovered completely their sphincter control and ability to walk, and even returned to strenuous occupations. Paræsthesiæ, dysfunction of the hands, sphincter disorders, mental disturbances, incoördination, and impaired joint sense improved fairly consistently; impaired vibration sense and hypo-æsthesia less so. Absent knee- and ankle-jerks often returned; increased jerks altered less frequently. Extensor plantar reflexes in cases of short duration sometimes became flexor. Figs. 4 and 5 are intended to illustrate the type of improvement which can occur.

Not all the improvement which we have observed could be attributed to lesions in the peripheral nerves. The glove and stocking distribution of sensory phenomena is not necessarily an indication that the causative lesion is situated in the peripheral nerves. The rate of improvement in paræsthesiæ is not in my experience any more rapid than that of other neurological phenomena. I have encountered a number of cases of pernicious anæmia in which the paræsthesiæ were initiated or increased by flexion of the head on the trunk: an observation which I feel suggests a central rather than a peripheral origin for this symptom.

In the central nervous system completely destroyed axis-cylinders cannot regenerate, but function in the spinal cord may improve perhaps owing to greater utilisation of uninjured pathways or even restoration of conductivity in some of the less damaged fibres. In the acute stages the fibres in the posterior and lateral columns show vacuolation and fatty changes. In treated cases where the progress of the condition has been arrested, and where clinical improvement has occurred, the vacuoles have gone and the fat has cleared away. There is very little myelin left

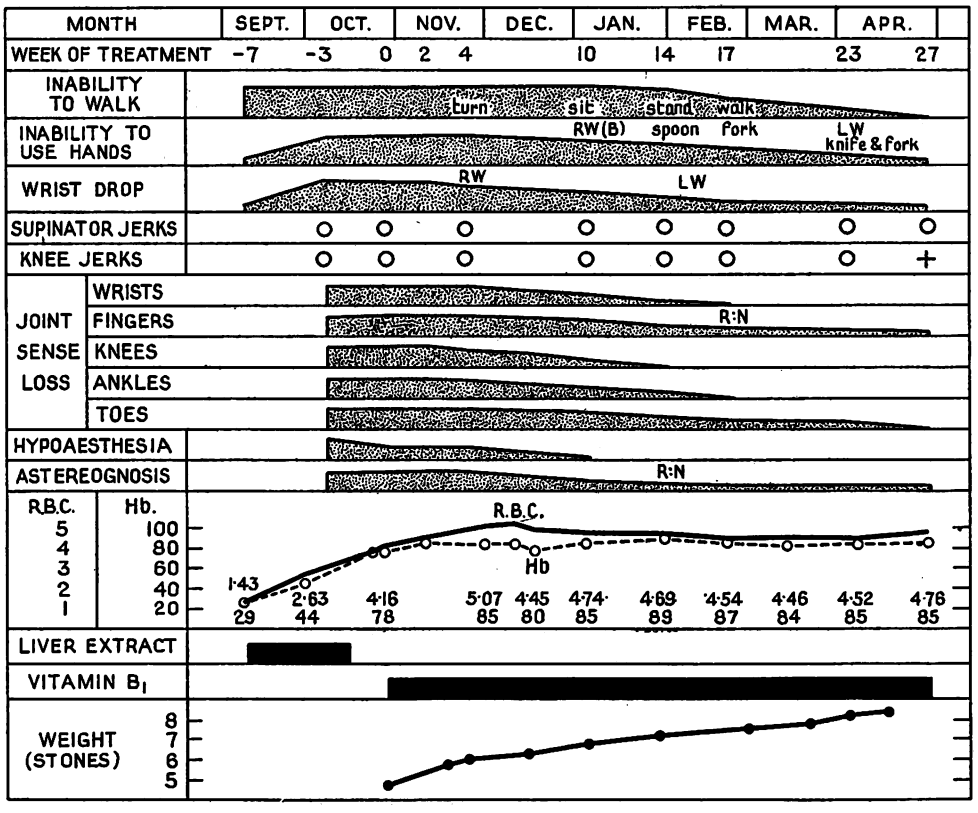

FIG. 6.—A case of pernicious anæmia in which polyneuritis followed prolonged anorexia, vomiting, and diarrhœa. Parenteral liver therapy was without effect on the neurological condition, but recovery followed the daily injection of vitamin B_1. The clinical picture was quite unlike subacute combined degeneration.

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and the area appears shrunken. There is, however, little proliferation of glia, and when quiescent the condition looks like any secondary degeneration. A variable number of intact nerve-fibres may be seen running through the affected area.

The substance in liver extract necessary for the nutrition of the nervous system is possibly distinct from the hæmopoietic principle, arising in a similar way from the interaction of two factors, extrinsic and intrinsic. An investigation of the dietaries of cases of pernicious anæmia has shown no differences between those with and those without spinal cord degeneration. On the other hand, certain facts suggest that there is an intrinsic difference and that the gastric juice in cases of subacute combined degeneration may lack a factor distinct from "hæmopoietin" and for which Hurst (1934) suggests the name "neuropoietin." In Addisonian pernicious anæmia, where defect in gastric secretion is marked, the incidence of subacute combined degeneration reaches 30–40 per cent. In pernicious anæmia associated with gastrectomy, and with polyposis and other diseases of the stomach, the incidence is also high. In contrast in this respect are macrocytic hyperchromic anæmias occurring in sprue, cœliac disease, and pregnancy in which factors other than gastric defect (for example deficient diet, poor absorption, demands of the fœtus) are largely responsible for the deficiency of hæmopoietic principle. In these cases free hydrochloric acid is often present in the gastric juice, the response to extrinsic factor alone (as Marmite) is usually excellent, and subacute combined degeneration is extremely rare.

If there is any difference between the gastric secretion in subacute combined degeneration and that in pernicious anæmia without spinal cord degeneration, however, it is not shown by the results of ordinary gastric analysis. Moreover, the pathological changes in the stomach of a patient dying with subacute combined degeneration were not different from those of patients showing pernicious anæmia without neurological phenomena (Magnus and Ungley 1938).

It has been suggested that the lesions in the nervous system in pernicious anæmia are the result of deficiency or poor utilisation of vitamin A, vitamin B, or iron. The occurrence in pernicious anæmia of a nutritional polyneuritis of the type associated with vitamin-B_1 deficiency must be extremely rare. In the only case I have encountered in which this combination was present, the picture was quite unlike that of subacute combined degeneration. Liver extracts relieved the anæmia without benefiting the polyneuritis, which slowly cleared up during the administration of vitamin B_1 alone (Fig. 6).

The patient, a woman 40 years of age, came under treatment for pernicious anæmia in 1934. In 1935 after suffering for four months from abdominal pain, vomiting, diarrhœa, and extreme anorexia she suddenly developed severe generalised polyneuritis. Treatment for five weeks with liver extract by injection brought about remission of the anæmia, but the polyneuritis became worse. Two weeks later injections of vitamin-B_1 concentrate 100 units daily were commenced. The patient was kept on a meat-free diet, and no further liver therapy was given. By this time she was completely helpless and incontinent with double wrist-drop and foot-drop. Recovery in power commenced by the twentieth day and was complete at the seventh month. She has since remained well on ordinary diet without treatment of any kind.

Estimation by Schopfer's method has shown no evidence of vitamin-B_1 deficiency in the blood in cases of pernicious anæmia with or without subacute combined degeneration. Treatment with concentrates of vitamin A and of vitamin B_1 has given disappointing results. Highly purified liver extracts such as anahæmin, which have proved as successful as other liver extracts in the treatment of subacute combined degeneration, contain neither of these vitamins.

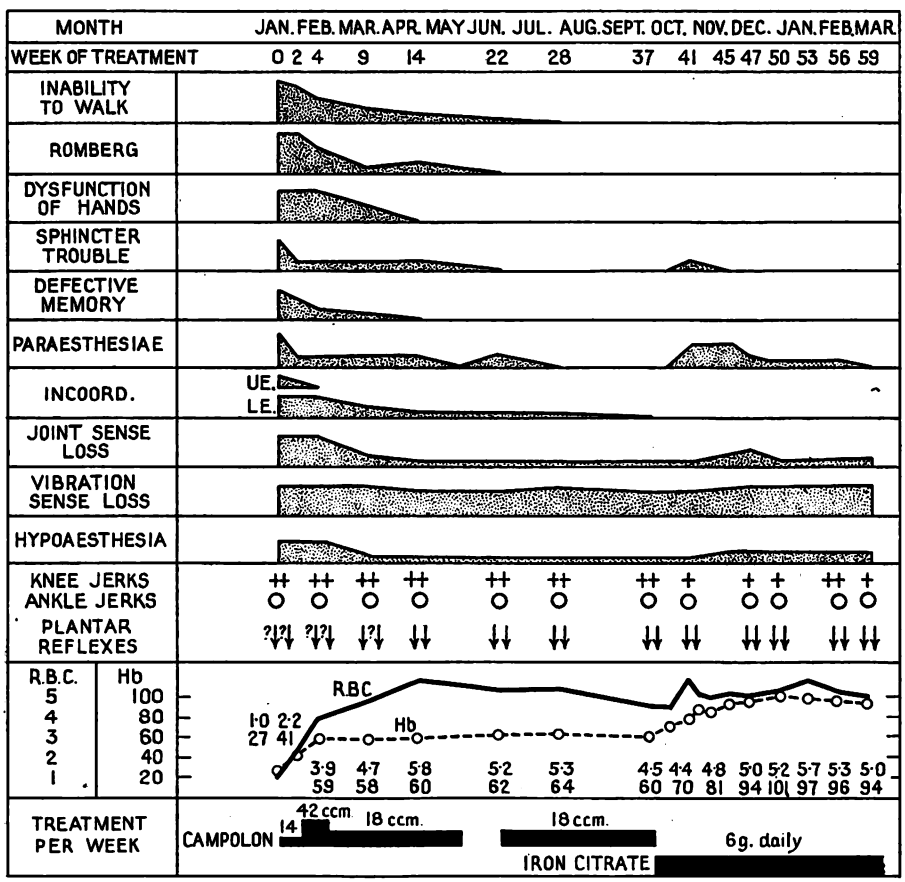

FIG. 7.—To illustrate that the neurological manifestations of pernicious anæmia may improve even in the presence of an iron-deficiency anæmia. The patient had suffered from chronic hypochromic anæmia several years previously (see Lect. II, Fig. 8). On the present occasion the picture was that of pernicious anæmia, but the tendency to iron deficiency was unmasked when the red blood-cell count was brought to normal with liver extract (see text).

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I find no evidence that large doses of iron alone are of value in subacute combined degeneration; indeed, I have seen relief of neurological symptoms occur in a case of pernicious anæmia and subacute combined degeneration coincidently with, and in spite of, the development of an iron deficiency.

The patient, a woman aged 50, was first admitted to hospital in May, 1929, with idiopathic hypochromic anæmia. She returned in January, 1934, with typical pernicious anæmia and subacute combined degeneration. Following injections of Campolon there was a reticulocyte response and a rapid rise of red blood-cells to over 5 million per c.mm. (Fig. 7). The hæmoglobin values failed to rise beyond 60 per cent., however, and during the next seven months the blood picture was again that of idiopathic hypochromic anæmia. There was ulceration at the angles of the mouth and spooning of the nails. Coincidently with and in spite of the development of this iron-deficiency anæmia the neurological condition showed marked improvement. Difficulty in walking, paræsthesiæ, and other subjective symptoms disappeared and the objective signs of involvement of the nervous system considerably diminished.

At present there is no conclusive evidence that any substance lacking the characteristic effect of liver upon hæmopoiesis in pernicious anæmia can arrest the progress or influence the course of subacute combined degeneration.

In conclusion two points may be emphasised: first, that most cases of subacute combined degeneration could be prevented by early recognition, accurate diagnosis, and efficient treatment of pernicious anæmia; secondly, that with adequate liver treatment, preferably parenteral, the nervous lesions can be arrested. In cases of relatively short duration the symptoms and signs may greatly diminish. No case of subacute combined degeneration, however severe (even if associated with bedsores and urinary infection), should be abandoned without resource to intensive parenteral liver therapy.

* * *

Time does not permit discussion of other problems which come under the heading of Nutrition and the Nervous System—e.g., the nervous lesions in pellagra, ergotism, and lathyrism; the possible rôle of deficiency of vitamin A, nicotinic acid, and other food factors in nervous disease; the nutritional origin of some types of amblyopia and retrobulbar neuritis; and the part played by nutritional deficiencies in the production of mental disorders.

In these, as in many other aspects of the study of nutritional deficiencies and their relation to disease, steady progress is being made through the close collaboration of the physician with experts in many branches of medicine and the allied sciences.

It is a pleasure to express my sincere thanks to Prof. J. C. Drummond, of University College, for testing for vitamin A in blood; Prof. R. A. Peters and Drs. Meiklejohn and H. M. Sinclair, of Oxford, for testing for vitamin B_1 in blood; Dr. L. J. Harris, of Cambridge, for testing for vitamin B_1 in urine by the bradycardia method; my colleagues in Newcastle-upon-Tyne, particularly Dr. F. J. Nattrass, for valued coöperation; and many others too numerous to mention.

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TREATMENT OF MENINGOCOCCAL MENINGITIS WITH SULPHANILAMIDE

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PROFESSOR OF MEDICAL PÆDIATRICS IN THE UNIVERSITY AND PHYSICIAN TO THE ROYAL HOSPITAL FOR SICK CHILDREN

Sulphanilamide and allied drugs are proving valuable in the treatment of infections other than those caused by the hæmolytic streptococcus. Favourable results have been recorded in *Bacillus coli* and other infections of the urinary tract (Helmholtz 1937, Walther 1937, Kenny et al. 1937). Gonococcal infections seem to yield rapidly (Crean 1937, Ballenger et al. 1937), as also infections with *Brucella abortus* (Richardson 1938, Francis 1938), and a considerable number of workers have claimed success in the treatment of meningococcal meningitis and meningococcal septicæmia. Buttle, Gray, and Stephenson (1936) showed experimentally that mice infected with virulent meningococci could be cured with sulphanilamide, and Proom (1937) demonstrated that the efficacy of the treatment diminished markedly with increase of the time-interval between infection with the meningococci and treatment with sulphanilamide. In the treatment of meningococcal meningitis sulphanilamide has been used successfully in conjunction with serum by McIntosh, Wilcox, and Wright (1937), Mitchell and Trachsler (1937), Brennemann (1937), Bernstein (1937), Basman and Perley (1937), and Zendel and Greenberg (1937), and alone by Schwentker, Gelman and Long (1937), Carey (1937) and Eldahl (1938).

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Until recently our routine treatment of the disease consisted in lumbar puncture and the intrathecal injection of antimeningococcal serum. In some cases serum was also injected into the cisterna magna and the ventricles. Our results had been so disappointing that we were prepared to try any other

TABLE I

—	C.S.F.			Prontosil.		Intrathecal serum (c.cm.)
	Cells per c.mm.	Diplococci in films.	Culture.	P. sol. (c.cm.)	P. alb. (g.).	
Nov. 2nd	2500	+	No growth.	10	3·3	10
„ 3rd	2700	+	Ditto.	20	3·3	..
„ 4th	240	—	Ditto.	10	3·3	10
„ 5th	270	—	Ditto.	..	2·0	..
„ 6th	..	..	..	..	2·0	..
„ 7th	..	..	..	..	1·3	..
„ 8th	210	—	No growth.	..	1·3	..
„ 9th	..	..	..	..	1·3	..
„ 10th	28	—	No growth.	..	1·3	..
„ 11th	..	..	..	..	1·3	..
„ 12th	..	..	..	..	1·3	..

P. sol. = Prontosil soluble (2·5 per cent. given by intramuscular injection).
P. alb. = Prontosil album given by mouth.

line of treatment that offered a reasonable prospect of success. From published reports sulphanilamide seemed worthy of trial. In using it our routine has been as follows. As soon as a tentative diagnosis is made from microscopic examination of the spinal fluid, and before the results of culture have been ascertained, Prontosil soluble is given by intramuscular injection and Prontosil album (sulphanilamide) by the mouth. All drugs containing sulphur are prohibited and eggs are excluded from the diet. This treatment has been continued until there is definite clinical improvement and the cerebro-spinal fluid has become sterile. Lumbar or cisternal puncture has been done daily. In our last 4 cases sulphanilamide in a concentration of 1 per cent. in normal saline has been injected either into the spinal theca or the cisterna magna. The drug is not very soluble and to get a solution of this concentration it is necessary to warm the saline to body

TABLE II

—	C.S.F.		Prontosil.		Intrathecal serum (c.cm.).
	Cells per c.mm.	Culture.	P. sol. (c.cm.).	P. alb. (g.).	
Dec. 2nd	308	Meningococci.	10	1·5	10
„ 3rd	250	Sterile.	10	3·0	..
„ 4th	100	Meningococci.	10	3·0	..
„ 5th	..	..	10	3·0	..
„ 6th	..	..	..	3·0	..
„ 7th	50	Sterile.	10	3·0	..
„ 8th	..	..	10	3·0	..
„ 9th	201	Sterile.	10	3·0	..
„ 10th to „ 13th	..	..	..	1·5	..
„ 14th	50	Sterile.	..	1·5	..
„ 17th	52	Ditto.	..	..	..

temperature. During the last six months we have treated 10 cases in this way.

CASE RECORDS

CASE 1.—Girl aged 3 years 11 months. Admitted to hospital on Nov. 1st, 1937. She had previously been healthy, but for three days had complained of severe headache and had been restless and sleeping badly. Her temperature was 102° F. and she was very ill. The tonsils were acutely inflamed. Next day there was definite nuchal rigidity, and the cerebro-spinal fluid (C.S.F.) obtained on lumbar puncture was found to contain 2500 cells per c.mm., mostly polymorphonuclears. Intracellular diplococci were seen in films of the sediment though culture of the fluid was sterile. (Unfortunately there was some delay in making cultures of the fluid.)

Lumbar and cisternal punctures showed a steady decline in the cell count of the fluid. Diplococci were seen in films of the fluid from the first two punctures, but subsequently no organisms were detected either in films or cultures. The temperature came to normal in 48 hours and the child made an uninterrupted and apparently complete recovery.

Treatment consisted in the intrathecal injection of 10 c.cm. of antimeningococcal serum on the second and fourth days and in the administration of prontosil for thirteen days, in all a total of 23 grammes (Table I). Slight cyanosis was noted on the third day, but rapidly cleared after cessation of the intramuscular injections.

CASE 2.—Female aged 12 months. Admitted on Dec. 2nd, 1937. Three weeks previously she had been fevered with abdominal pain and vomiting, and "spots" had been noted on the limbs and face. She had then become listless and her appetite had been poor; a week before admission, fever with vomiting and constipation had recurred. When admitted she was extremely irritable; there was nuchal rigidity and a positive Kernig's sign. The C.S.F. (lumbar puncture) showed 308 cells per c.mm.,

TABLE III

—	C.S.F.			Prontosil.	
	Cells per c.mm.	Polymorphs (%).	Culture.	P. sol. (c.cm.).	P. alb. (g.).
Nov. 10th	13,000	95	Meningococci.	10	1·3
„ 11th	..	..	Contamination.	5	2·0
„ 12th	2,500	..	Sterile.	10	2·0
„ 13th	610	60	Ditto.	10	2·0
„ 14th	530	27	Ditto.	20	2·0
„ 15th	..	..	..	20	2·0
„ 16th	121	41	..	10	2·0
„ 17th	..	..	..	20	2·0
„ 18th	..	..	..	10	2·0
„ 19th	170	46	Sterile.	10	2·0
„ 20th	..	..	..	10	2·0
„ 21st	..	..	..	..	2·0
„ 23rd	..	..	..	..	1·3
„ 24th	46	33	Sterile.	..	1·3
„ 25th	..	..	..	..	1·3
„ 26th	33	5	..	..	1·3

mostly polymorphonuclears. Meningococci were seen in films of the deposit and were grown on culture.

Lumbar puncture, performed frequently during the next fortnight, showed a steady decrease in the number of cells. The fluid became sterile on the third day after admission. The temperature fluctuated between 98° and 101° F. during the first week but thereafter remained normal. Clinical improvement was rapid and no abnormal signs were present after two weeks' treatment. She now appears perfectly well.

Treatment.—Antimeningococcal serum (10 c.cm.) was given on the day of admission only, and during twelve days 32 g. of prontosil was administered (Table II).

CASE 3.—Female aged 4 months. Admitted on Nov. 10th, 1937. Five days previously she had become fevered with a nasal discharge, and two days later there was twitching of the limbs. On admission she was acutely ill with fever, a bulging fontanelle and much nuchal rigidity. The C.S.F. contained 13,000 cells per c.mm. (95 per cent. polymorphonuclears) and meningococci were grown on culture. During the first 48 hours the temperature varied widely

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(99°–103° F.) but thereafter it fell gradually, reaching normal on the eighth day of treatment. The infant's condition improved steadily; by the sixth day she was bright and taking interest in her surroundings, but some spinal rigidity persisted until about the twelfth day. When dismissed on the eighteenth day she seemed well, and at 8 months she can sit up alone and is beginning to crawl; she appears to be a perfectly healthy infant.

During seventeen days' *treatment* the child received 35 g. of prontosil (Table III). There was no cyanosis.

CASE 4.—Girl aged 3 years. Admitted on Dec. 27th, 1937, with two days' history of headache, increasing drowsiness, and some twitching of the hands. She was semicomatose, with a temperature of 102° F. Kernig's sign and nuchal rigidity were strongly positive. The C.S.F. (lumbar puncture) contained 11,200 cells per c.mm. mostly polymorphonuclears, and meningococci were grown from

TABLE IV

—	C.S.F.			Prontosil.	
	Cells per c.mm.	Polymorphs (%).	Culture.	P. sol. (c.cm.).	P. alb. (g.).
Dec. 27th	11,200	92	Meningococci.	20	1·5
„ 28th	3,400	89	Sterile.	20	3·0
„ 29th	430	64	Ditto.	20	3·0
„ 30th	..	..	..	..	2·0
„ 31st	17	14	Slight meningococcal growth.	..	..
Jan. 1st	18	3	Sterile.	20	2·0
„ 2nd	..	..	..	..	2·0
„ 3rd	24	18	Sterile.	..	2·0
„ 4th	..	..	..	..	2·0
„ 5th	6	..	Sterile.	..	..

it. The temperature settled on the fourth day by which time there was no nuchal rigidity. She was sent home after ten days in hospital, being apparently well. There is no evidence of sequelæ.

Treatment.—Altogether the child received 21·5 g. of prontosil during nine days (Table IV). No cyanosis was evident.

CASE 5.—Male aged 8 months. Admitted on Jan. 10th, 1938. He had been irritable for a week and head-retraction had been noted for two days. He was semicomatose and opisthotonos was marked. The C.S.F. (lumbar puncture) contained 1600 cells, mostly polymorphonuclears, and on culture showed a meningococcal growth.

Treatment.—During eleven days he received 20 g. of prontosil (Table V). There was no cyanosis. He was gravely ill for three days but the temperature settled on the fourth day and improvement became rapid. Some nuchal rigidity persisted for a fortnight but on dismissal after eighteen days in hospital he seemed well. There is no evidence of sequelæ.

CASE 6.—Male aged 10 months. Admitted on Feb. 7th, 1938. Six weeks before admission head-retraction was noticed during an illness regarded as a "feverish cold." After this he was constipated, with frequent vomiting and loss of weight. During the week before admission he had become increasingly drowsy. On admission there was marked nuchal rigidity, emaciation, drowsiness, and a bulging fontanelle.

During the sixteen days' *treatment* the infant received 35 g. of prontosil. There was no cyanosis. No clinical improvement was seen, and there was irregular low pyrexia until the twentieth day in hospital when the temperature rose sharply. He died twenty-two days after admission. It is to be noted that although the C.S.F. became sterile in six days (Table VI) no clinical improvement occurred.

At *post-mortem examination* the ventricular system was found to be greatly dilated. There was a moderate

TABLE V

—	C.S.F.				Prontosil.	
	Cells per c.mm.	Polymorphs (%).	Culture.	Sulph.* (mg./100 c.cm.)	P. sol. (c.cm.)†	P. alb. (g.)
Jan. 10th	1600	79	Meningococci.	..	20	0·5
„ 11th	1700	66	Sterile.	1·39	..	2·0
„ 12th	80	45	Ditto.	..	5	2·0
„ 13th	71	16	..	..	5	2·0
„ 14th	27	14	..	3·1	5	2·0
„ 15th	..	..	..	..	..	2·0
„ 16th	26	6	..	2·0	..	2·0
„ 17th	..	..	..	..	..	1·5
„ 18th	27	5	..	6·7	..	1·5
„ 19th	..	..	..	..	..	1·5
„ 20th	..	..	..	3·2	..	1·5
„ 22nd	25	3	Sterile.	..	..	..

* Sulph. = sulphanilamide.
† In this and the remaining cases the 5 per cent. solution was used.

amount of fibrino-purulent exudate at the base of the brain, with extensive matting of the meninges in this area. Cultures taken from the exudate remained sterile.

CASE 7.—Girl aged 2 years 5 months. Admitted on Jan. 11th, having had fever and rhinitis for a fortnight, with headache and stiff neck for two days. She was gravely ill, with drowsiness and nuchal rigidity. The C.S.F. (lumbar puncture) contained 4500 cells per c.mm., mostly polymorphonuclears, and culture yielded meningococci. She remained very ill, with fever, irritability, and rigidity for seventeen days. Rigidity then passed off and, although fever continued and culture of C.S.F. gave a heavy meningococcal growth, there were no physical signs of meningitis. Unfortunately cyanosis became severe at that time and vomiting was troublesome so that it was necessary to discontinue prontosil treatment for twelve days. The treatment was then recommenced, but cyanosis soon returned and the C.S.F. still yielded meningococci. In an attempt to minimise the toxic effects of the drug a 1 per cent.

TABLE VI

—	C.S.F.				Prontosil.	
	Cells per c.mm.	Polymorphs (%).	Culture.	Sulph. (mg./100 c.cm.).	P. sol. (c.cm.)	P. alb. (g.).
Feb. 8th	750	40	Meningococci.	..	..	3·0
„ 9th	700	38	Ditto.	6·7	10	1·5
„ 10th	830	..	Sterile.	..	10	2·0
„ 11th	600	43	Ditto.	1·7	10	2·0
„ 12th	590	19	Ditto.	3·1	10	2·0
„ 13th	96	..	..	1·4	10	2·0
„ 14th	73	2	Meningococci.	1·2	10	2·0
„ 15th	..	..	..	..	10	2·0
„ 16th	32	8	Sterile.	2·0	10	2·0
„ 17th	..	..	..	..	10	2·0
„ 18th	..	..	..	..	..	2·0
„ 19th	40	5	Sterile.	3·8	..	2·0
„ 20th	..	..	..	..	..	2·0
„ 21st	800	2	Sterile.	2·9	10	2·0
„ 22nd	..	..	..	..	..	2·0
„ 24th	26	..	Sterile.	..	..	..
„ 27th	32	10	Ditto.	..	..	..

solution of sulphanilamide in normal saline was then given intrathecally, other forms of the drug being withheld. After five days the fluid became permanently sterile and five days later the temperature settled. There were no further relapses. The child's physical condition improved steadily after the seventeenth day, but she remained peevish and irritable. When she was dismissed after two months in hospital there was slight rigidity of the legs, though the reflexes were not abnormal. When seen

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TABLE VII

—	C.S.F.				Prontosil.		
	Cells per c.mm.	Polymorphs (%).	Culture.	Sulph. (mg./100 c.cm.).	P. sol. (c.cm.)	P. alb. (g.).	Intrathecal sulph. (c.cm.)
Jan. 11th	4500	76	Meningococci.	..	10	1	..
„ 12th	2900	86	Sterile.	15·4	10	3	..
„ 13th	2300	85	..	..	10	3	..
„ 14th	700	87	Meningococci.	17·8	15	3	..
„ 15th	500	78	Ditto.	2·4	15	3	..
„ 16th	420	78	Ditto.	2·0	15	3	..
„ 17th	..	..	..	..	..	3	..
„ 18th	1850	89	Meningococci.	0·6	15	3	..
„ 19th	1320	90	Ditto.	5·0	30	3	..
„ 20th	1600	92	Sterile.	5·6	30	3	..
„ 21st	620	81	Ditto.	5·9	30	3	..
„ 22nd	480	98	Ditto.	7·8	30	3	..
„ 23rd	1300	93	Meningococci.	5·9	15	2	..
„ 24th	310	72	Ditto.	3·6	15	2	..
„ 25th	250	87	Sterile.	10·0	15	2	..
„ 26th	..	..	..	..	15	2	..
„ 27th	600	78	Sterile.	6·9	10	2	..
„ 28th	800	95	Meningococci.	..	Prontosil stopped.		
Feb. 1st	157	80	Ditto.	Trace	..	..	..
„ 9th	900	76	Ditto.	..	20	3	..
„ 10th	..	..	..	..	15	3	..
„ 11th	320	68	Sterile.	5·3	10	3	20
„ 12th	210	..	Ditto.	4·5	..	..	20
„ 13th	112	49	..	1·1	..	..	20
„ 14th	1070	93	Meningococci.	1·3	..	..	20
„ 15th	820	78	Sterile.	Trace	..	..	30
„ 17th	200	41	Ditto.	„	..	..	10
„ 18th	..	..	..	..	10	..	..
„ 19th	440	68	Sterile.	..	Prontosil stopped.		
Mar. 1st	600	81	Ditto.	..	..	..	..
„ 10th	450	67	Ditto.	..	..	..	..

six weeks later she appeared to be perfectly healthy.

Treatment.—The child received in all 335 c.cm. of 5 per cent. prontosil soluble intramuscularly, 53 g. of prontosil album (sulphanilamide) by mouth and 120 c.cm. of 1 per cent. sulphanilamide in normal saline intrathecally—in all 71 g. (Table VII).

CASE 8.—Boy aged 2 years. Admitted on Feb. 15th, 1938. He had been well until four days previously when he became drowsy and irritable. There was some vomiting, and twitching of the limbs was noticed on the day before coming to hospital. On admission there was much head retraction, and a profuse purpuric eruption over the lower limbs. The temperature was 101° F. Lumbar puncture gave a fluid containing 9400 cells per c.mm., mostly polymorphonuclears, with a heavy growth of meningococci.

Treatment.—During the next seventeen days he received 42 g. of prontosil by intramuscular and intrathecal injection and by the mouth (Table VIII). Irregular pyrexia continued until the fourteenth day and clinical improvement was slow. Drowsiness and nuchal rigidity persisted for twelve days, but thereafter he rapidly became brighter and the nuchal rigidity soon passed off. Moderate cyanosis appeared on the fourth day of treatment but cleared up gradually after the substitution of intrathecal for intramuscular injections. The cell count in C.S.F. fell somewhat irregularly, but the culture became sterile 48 hours after treatment commenced. When he was dismissed after twenty-four days in hospital there was a suspicion of an early spastic condition of the legs. He now seems very well, but his walking is not yet as good as it was before the illness.

CASE 9.—Boy aged 9 years 8 months. Admitted on Feb. 22nd, 1938. He had complained of severe headache and dizziness for three days and there had been frequent vomiting. The temperature was only 99° F., but nuchal rigidity and Kernig's sign were strongly positive. A few petechial hæmorrhages were scattered over the body. The C.S.F. (lumbar puncture) contained 11,100 cells per c.mm., mostly polymorphonuclears, and culture gave a heavy meningococcal growth. Prontosil treatment was commenced at once.

Treatment.—Prontosil was given for seven days and he received 21·5 g. orally and by intramuscular and intrathecal injection. Clinical improvement was rapid, the temperature settled on the sixth day by which time the headache and nuchal rigidity had cleared up. Cyanosis appeared after 24 hours' treatment but cleared rapidly after the substitution of intrathecal for intramuscular injections. The C.S.F. became sterile after 48 hours' treatment and the cell count in the fluid fell rapidly (Table IX). On dismissal after sixteen days in hospital the boy was perfectly well.

CASE 10.—Girl aged 3 years. Admitted on March 28th, 1938. She had been healthy till a week previously when she became drowsy and out of sorts. Three days later she complained of severe headache, vomited several times and became delirious. On admission she was wildly delirious; there was a purpuric rash on the trunk and limbs and generalised muscular rigidity, and the temperature was 100° F. The C.S.F. obtained by lumbar puncture was purulent

TABLE VIII

—	C.S.F.				Prontosil.		
	Cells per c.mm.	Polymorphs (%).	Culture.	Sulph. (mg./100 c.cm.).	P. sol. (c.cm.)	P. alb. (g.).	Intrathecal sulph. (c.cm.)
Feb. 15th	9,400	76	Meningococci.	..	20	1·0	..
„ 16th	15,500	90	Ditto.	5·0	10	3·0	..
„ 17th	1,700	83	Sterile.	4·1	..	3·0	30
„ 18th	1,200	70	Ditto.	5·2	10	3·0	10
„ 19th	2,300	95	Ditto.	10·5	10	3·0	20
„ 20th	110	30	Ditto.	7·7	10	3·0	20
„ 21st	..	..	..	..	..	3·0	20
„ 22nd	140	27	Sterile.	5·4	..	3·0	20
„ 23rd	..	..	..	..	..	1·5	..
„ 24th	40	24	Sterile.	..	No prontosil.		..
„ 25th	..	..	..	Trace	..	2·0	..
„ 26th	..	..	..	..	..	2·0	..
„ 27th	350	70	Sterile.	..	..	2·0	..
„ 28th	..	..	..	..	..	2·0	..
Mar. 1st	..	..	..	..	..	2·0	..
„ 2nd	..	..	..	..	..	2·0	..
„ 3rd	6	..	Sterile.	..	..	2·0	..

and under greatly increased pressure. It contained 30,000 cells per c.mm. (99 per cent. polymorphonuclears), and abundant extra- and intra-cellular diplococci; culture yielded a heavy growth of meningococci. The temperature ranged between 100·4° F. and normal during the first ten days in hospital; thereafter it was normal.

Treatment with prontosil by the mouth and by intramuscular injection was instituted immediately after admission and, on the seventh, eighth, and ninth days in hospital, 20 c.cm. of a 1 per cent. solution of sulphanilamide was given intrathecally. Although the C.S.F. became sterile three days after admission the child's condition improved very slowly until intrathecal injections of sulphanilamide were started; thereafter the general condition improved rapidly and signs of meningeal irritation ceased. Convalescence was uneventful and she now seems to have recovered completely. In all she received 33 g. of prontosil in eleven days (Table X).

DISCUSSION

Treatment with sulphanilamide seems to give very much better results than those we had from treatment with antimeningococcal serum. Of the 10 children treated with sulphanilamide only 1 has died, whereas in a series of 30 cases treated with serum there were only 4 recoveries. Of these 30

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patients, 19 were infants under one year of age and all save 1 of them died. In our present series of 10 cases 4 were under one year of age and only 1 of these has died. This child (Case 6) was admitted to hospital after he had been ill for six weeks and death was probably due to hydrocephalus, for

TABLE IX

—	C.S.F.				Prontosil.		
	Cells per c.mm.	Polymorphs (%).	Culture.	Sulph. (mg./100 c.cm.).	P. sol. (c.cm.)	P. alb. (g.).	Intrathecal sulph. (c.cm.)
Feb. 22nd	11,100	87	Meningococci.	..	30	1·0	..
„ 23rd	3,600	97	Ditto.	3·1	10	3·0	..
„ 24th	3,900	80	Sterile.	2·7	..	2·5	15
„ 25th	870	64	Ditto.	3·3	..	2·5	10
„ 26th	420	79	Ditto.	..	..	2·5	10
„ 27th	..	..	..	..	..	2·5	..
„ 28th	..	..	..	..	..	2·5	..
Mar. 1st	..	..	..	..	..	2·5	..
„ 3rd	9	..	Sterile.	..	..	..	..

cultures of the cerebro-spinal fluid before death and of the meninges at autopsy were sterile.

There seems to be considerable difference of opinion about the dosage of the drug. Cases have been reported in which the cerebro-spinal fluid was permanently sterilised by giving 3 grammes of sulphanilamide spread over three days (McIntosh et al. 1937), whilst as much as 38 g. in eighteen days has been given to a child aged 17 months (Bernstein 1937). In view of the very high mortality-rate in our previous cases we felt justified in giving large doses. In infants we have commenced by giving 2–3 g. per day, divided into six doses, the total amount given depending on the course of the disease. The smallest amount we have given is 21 g. in seven days, whilst the largest amount is 71 g. spread over a period of twenty-six days. Except for cyanosis in a few of the cases there have not been any symptoms of poisoning.

In 6 of the cases the concentration of sulphanilamide in the cerebro-spinal fluid was estimated and was found to vary considerably; the maximum

TABLE X

—	C.S.F.				Prontosil.		
	Cells per c.mm.	Polymorphs (%).	Culture.	Sulph. (mg./100 c.cm.).	P. sol. (c.cm.)	P. alb. (g.).	Intrathecal sulph. (c.cm.)
Mar. 28th	30,000	99	Meningococci.	3·2	35	3·0	..
„ 29th	25,000	94	Ditto.	2·9	30	3·0	..
„ 30th	1,500	..	Sterile.	..	10	3·0	..
„ 31st	2,150	..	Ditto.	..	10	3·0	..
April 1st	300	34	Ditto.	2·9	10	3·0	..
„ 2nd	2,500	..	..	2·4	..	3·0	..
„ 3rd	610	57	Sterile.	1·3	10	3·0	20
„ 4th	160	58	Ditto.	2·1	..	3·0	20
„ 5th	140	..	Ditto.	1·2	..	1·5	20
„ 6th	..	..	..	..	..	1·5	..
„ 7th	61	22	Sterile.	..	..	..	..
„ 13th	8	0	Ditto.	..	..	..	..

amount detected was 17·8 mg. per 100 c.cm., the minimum 1·2 mg. The amount found in the cerebro-spinal fluid did not seem to bear any relationship to the course of the disease, nor to the speed with which the fluid was sterilised. In Case 7 a concentration of the drug of 17·8 mg. per 100 c.cm. failed to sterilise the cerebro-spinal fluid, while in Case 5 it became sterile with a concentration of 1·39 mg. It is possible, however, that there may have been higher concentration at some time in the intervals between spinal punctures.

Our experience of the intrathecal or intracisternal injection of sulphanilamide suggests that it may prove a highly efficient way of giving the drug. In Case 7 where we had failed to render the cerebro-spinal consistently sterile by oral and intramuscular administration, injection of a 1 per cent. solution into the subarachnoid space rapidly achieved this end. In Cases 8 and 9 intramuscular injection caused cyanosis. By giving the drug by intrathecal instead of by intramuscular injection cyanosis was abolished and recovery took place rapidly. In Case 10, in spite of the fact that cultures of the cerebro-spinal fluid were sterile, clinical improvement was delayed until the drug was given by intrathecal injection. Thereafter signs of meningeal irritation rapidly disappeared and convalescence proceeded satisfactorily. It seems, therefore, that this method of treatment may be of value in cases in which the cerebro-spinal fluid does not rapidly become sterile, in cases which show intolerance to the drug when given by intramuscular injection, and in cases in which the meningeal symptoms do not clear up rapidly.

Without wider experience one is not justified in claiming that sulphanilamide is superior to the remedies previously used in meningococcal meningitis, but from our results and from those obtained by others it appears to be at least as effective as any other form of treatment. In this country, where serum therapy has not met with the same success as it has in the United States, it seems especially worthy of further trial.

SUMMARY

1. Ten children suffering from meningococcal meningitis have been treated with sulphanilamide.

2. The cerebro-spinal fluid became sterile in all the cases.

3. Four of the patients were less than a year old, and one of these died.

4. All the six patients over a year old recovered.

We have pleasure in expressing our thanks to the staff of the pathological and of the biochemical laboratories for their assistance in the investigation of our cases, and to Messrs. Bayer for a supply of prontosil.

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MIDDLESEX HOSPITAL ATHLETIC GROUND.—The new athletic ground at Chislehurst presented to the Middlesex Hospital by Sir Edward Meyerstein will be ready for use on April 30th. It occupies 18 acres of the Foxbury site—more than double the size of the present ground at North Wembley—and has a large pavilion with two floors. Chislehurst is easily reached by train from Charing Cross, Cannon-street, or London Bridge.

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ACTION OF TESTOSTERONE PROPIONATE ON THE FEMALE

CLINICAL APPLICATIONS AND DOSAGE

By George L. Foss, M.A., M.B. Camb.

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In experiments on rhesus monkeys Zuckerman (1937) found that inhibition of follicular maturation and luteinisation, with consequent suppression of the menses, followed administration of 25 mg. of testosterone propionate twice weekly during a period of seven months. Cotte, Martin, and Mankiewicz (1937) have reported similar results in the rabbit, and Robson (1936 and 1937) has shown that in rodents simultaneous administration of testosterone and œstrone prevents œstrus.

The natural outcome of this experimental work has been the use of testosterone as a remedy for excessive and irregular uterine bleeding due to hyperfolliculinæmia in the human female, especially as Zuckerman's work was fairly conclusive that it caused no undesirable secondary effects, except perhaps enlargement of the clitoris.

Loeser (1938a) began using testosterone propionate for gynæcological conditions in April, 1937, and I have used it since July, 1937. Several papers have appeared already on its employment for painful breast conditions, chronic cystic mastitis and premenstrual mastodynia, also for dysmenorrhœa (Desmarest and Capitain 1937 and 1938, Goormaghtigh 1938, Turpault 1937, Bender 1937). My early results in gynæcological disorders were variable, probably because my doses were not always adequate. Experiments with a eunuch (Foss 1937b) and observations made about the same time by Hamilton (1937) in America suggested that doses of 40 mg. per week probably would be sufficient. My first case supported this belief.

CASE RECORDS

Case 1.—Mrs. A, aged 45, with severe metrorrhagia, was awaiting hysterectomy; her condition was very poor with severe anæmia, dyspnœa, and lack of energy. Seen on July 18th she was given 40 mg. of testosterone propionate twice weekly in five doses. Five days after the last injection curettage showed that the endometrium was in the resting stage. Three days later scanty bleeding started, lasting six days, six diapers only being soiled. Immediately a second dose of 200 mg. in five injections was given during fifteen days. Curettage on the twentieth day showed resting-stage endometrium which was difficult to obtain by the Sharman and Sheehan (1937) and Foss (1937a) curettes. On the twenty-seventh day no endometrium at all was procured. From the twelfth to the thirty-fifth day of the cycle there was scanty brown staining, but after this no further bleeding was seen until Jan. 1st–8th, 1938; it was scanty and entailed the use of twelve diapers. During this period of twenty weeks' amenorrhœa, she was troubled with hot flushes and sweats which were readily controlled by œstrone dragées. One other very scanty period only has been seen since then (Feb. 12th–19th) using four diapers. So far this patient has been saved from hysterectomy, and her general condition improved very rapidly once the flooding stopped.

Case 2.—Miss B, aged 25, who had menorrhagia and dysmenorrhœa, was given 140 mg., 200 mg., and 150 mg. in three consecutive cycles without any effect on the loss or on the length of the cycles. Later she was given 500 mg., again without altering the duration of the cycle, but the loss was not quite so excessive and dysmenorrhœa was still slight.

Case 3.—Mrs. C., aged 48, was seen in September last. She gave a history of continuous bleeding for 2½ months without stopping. Before this she had had very severe floodings in November, 1936, and January, 1937, lasting three weeks; she also gave a history of many years' menorrhagia with flooding and passage of clots. Injections of testosterone propionate were given and after 270 mg. had been injected in nineteen days the bleeding stopped. Amenorrhœa persisted for sixty-three days; then she had a fairly heavy period lasting eleven days. Since Dec. 22nd she has been amenorrhœic. Curettage a week after the last injection showed endometrium with small early-interval-type glands.

Cases of longer standing, however, seem to require very much larger doses.

Case 4.—Mrs. D., aged 40, a very obese woman with a history of severe menorrhagia, had a continuous hæmorrhage from February, 1937, until she was curetted on July 12th when her endometrium was found to show some hyperplasia. The loss was very excessive all the time and she used three or four diapers daily, changing even during the night. After curettage, bleeding continued for three weeks and then she had a clear week. Injections of testosterone were started on Sept. 29th; after 250 mg. bleeding began in three days and was almost as copious as before, but the interval had increased. Rhythmic treatment was given now for the next five months. The only result was to re-establish monthly cycles once more, and there was not much effect on the loss. Dosage was therefore increased and after 500 mg. had been given in three weeks, bleeding was more normal lasting only six days instead of ten to fourteen and there was no flooding or clots. An interesting fact was noticed now—she complained of numerous hot flushes and sweats both by day and night. After the last bleeding the dosage was increased to 200 mg. weekly and the menopausal symptoms have become much worse, as many as ten to twenty flushes daily being counted.

This moderately severe case has shown how variable the effective dosage is. A still more refractory case has been treated and has been a failure so far, after very great dosage.

Case 5.—Miss E., aged 30, a nurse, had pneumonia in 1936. Previously her periods had been regular (every 28 days and lasting 5–7 days). A fortnight after her illness, bleeding started, with variation in flow and an occasional clear day, and she had been bleeding for fifteen months. Medical treatment had failed and in April, 1937, she was curetted; the endometrium showed hyperplasia. No benefit at all was obtained. Starting on October 1st, 340 mg. of testosterone propionate was given in three weeks, with perhaps some slight diminution in loss and with more frequent days of rest. The losses persisted, however, and owing to the nature of her occupation, treatment was not always available. She was admitted to hospital again in March, 1938, and examined under anæsthesia; the uterus was small. An intensive course of testosterone propionate was started on March 14th and she was given 100 mg. daily. After 800 mg. bleeding stopped for four days, but it then started once more just as badly. After 2000 mg. bleeding still persists and treatment is being continued.

For a case of metrostaxis in a girl of 18 testosterone proved of great value.

Case 6.—Miss F., aged 18, had the menarche at 15; it was followed by two scanty periods and then three months' amenorrhœa, after which she had hæmorrhage lasting four months. Dilatation and curettage on July 20th, 1935, showed glandulocystic hyperplasia and she was treated with a small dose of radium. Amenorrhœa persisted for a year, followed by alternating periods of flooding and short rests. During this time she had been treated with corpus

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luteum, Sistomensin, and prolan by mouth. When seen on Jan. 24th, 1938, she had been bleeding almost continuously for twelve months and was in poor health. The loss varied and she wore a diaper continuously. She had about two days clear and then bleeding would start again in gushes. Injections of 20, 40, and 50 mg. of testosterone propionate were given twice weekly and afterwards the dose was increased to 100 mg. After 510 mg. in twenty-five days, bleeding stopped completely. This was followed by a slight discharge, but after a further 200 mg. she left off all diapers. Five weeks after the last injection she had had no suspicion of return of bleeding. She has regained her energy and her general health has improved. A normal five-day period started on April 3rd after six weeks' amenorrhœa.

It appears from my experience of about 16 cases that for most patients total doses of 300–800 mg. are required, according to the severity and duration of bleeding and the nature of the disorder to inhibit endometrial proliferation. In some cases of menorrhagia cyclical doses of 20–40 mg. given twice weekly for a few months are sufficient to counteract follicular overaction, or to restore a cyclical rhythm in metrorrhagia. Severe cases need a total dose of 800–2000 mg. given in daily injections of 100 mg. or twice-weekly injections of 150–200 mg., the individual dosage being adjusted to the clinical history.

The successful results of Loeser (1938a and b) were obtained with very similar dosage.

DISCUSSION

Why testosterone propionate should have an action so antagonistic to that of œstradiol is not known. Chemically testosterone is a very close relation to œstradiol and it can be made synthetically by complete hydrogenation of dihydroxy-œstrin or œstradiol. It is known that administration of testosterone propionate in a male gives rise to excretion of both androgen and œstrogen in the urine. This was shown originally by Steinach, Kun, and Peczenik (1936) on rats and later in humans (Steinach and Kun 1937) and has been demonstrated several times by Callow (1938) in my cases. Urine analysis, kindly carried out by Callow, of a eunuch under treatment with testosterone propionate, showed that there was a parallel increase in output of androgen and œstrogen during administration, in the ratio of 1·6 to 1. After five weeks' rest from therapy this ratio was 3·83 to 1, whereas in the normal male urine the ratio was 1·71 to 1.

The fact remains that experimental and clinical work has proved that testosterone propionate injected into females counteracts the natural follicular hormone. Two possibilities suggest themselves: (*a*) that the male hormone is a direct antagonist of the follicular hormone, and (*b*) that it inhibits anterior pituitary gonadotropic hormone. The second is perhaps the more likely hypothesis, as shown by inhibition of follicular maturation in the rhesus monkey.

Quantitative assays for gonadotropic hormone in the urine from a eunuch (Foss 1938), while at rest and also while under high dosage of male hormone, might shed some light on this matter, but unfortunately the results are not yet available. Clinically Salmon (1937) found that testosterone propionate gave relief from menopausal symptoms in an ovariectomised woman and also reduced the amount of gonadotropic hormone recoverable from her urine. Further assays on the urine of menopausal women, before and after male-hormone therapy, will be awaited with interest.

Before testosterone propionate can be regarded as a valuable addition to gynæcological practice, it is essential to study its effects in very large doses over a long period. In a comparatively small series of 16 cases during the last nine months, doses up to 2200 mg. have been given in periods ranging from three to twenty-eight weeks, and in all this series no unpleasant side effects have been noticed. These doses are smaller proportionately than were given by Zuckerman (1937) to monkeys weighing 11 lb. and he was unable to find any abnormal or harmful effect beyond enlargement of the clitoris. In patients receiving intensive therapy for a short time or moderate doses over a long period, there was definite increase in size of the clitoris. I do not regard this as an unpleasant effect however, for no patient complained of discomfort or swelling of the genitalia, and in each case it had to be looked for. In some the clitoris was about ¾ in. long and ¼ in. across at the base. Whether its size decreases again when administration of male hormone ceases is not yet known.

Loeser (1938b) in one case noticed some voice change to the gruff male type after 1500–2000 mg., but the voice soon returned to normal on discontinuing treatment. It was doubtful whether this was due to the therapy.

The amenorrhœa induced by testosterone propionate is also of fairly short duration and restitution of previous normal rhythm takes place when injections are finished. In most cases the endometrium is in the resting stage and the glands are of the interval type; in no case has a secretory-phase endometrium been found. Many reports, already referred to, have appeared on the use of testosterone for mastopathia and mastodynia. During treatment the breasts decrease in size, and this may have a useful application for macromastia of endocrine origin.

CASE 7.—Miss G., aged 22, was a medical student with lobular mastitis. She had had a serous and sometimes blood-stained nipple discharge for eight months. She was given 270 mg. testosterone propionate in a month. Menstruation was not inhibited but its onset was unexpected and sudden on two occasions, owing to the absence of premenstrual mammary congestion and fullness, malaise, and backache. The discharge gradually became more sticky and eventually stopped. During this time both breasts diminished in size—a fact reported both by her mother and herself—but as yet there has been no appreciable alteration in its lobulated condition.

From my experience in over 40 cases of males and females treated with testosterone propionate, it appears that in the absence of œstrogen in the body—for example in eunuchs—small doses of male hormone suffice. To obtain a similar effect when testicles are present requires very much larger doses possibly because of the breakdown of endogenous testosterone to œstrogen, especially in old age. In females the dose of testosterone must be much greater still, since higher levels of œstrogen are encountered, especially in conditions such as metropathia hæmorrhagica. The finding of Zuckerman (1936) that a testosterone-œstrone ratio of 7 to 1 is necessary to inhibit the action of œstrone on the immature rhesus monkey's prostate probably applies to human dosage. Experimentally, endometrial glandulocystic hyperplasia can be produced with doses of 50–100 mg. of œstradiol benzoate. Accordingly to treat severe cases of this condition due to endocrine dysfunction 350–1000 mg. would probably be an average dose.

SUMMARY

Metrorrhagia and menorrhagia can as a rule be controlled by injection of testosterone propionate in adequate doses. The amount required depends on the clinical findings and the pathology of the condition.

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A temporary therapeutic menopause, with its associated symptoms, can be induced with large doses. Menstruation may be postponed for several months after treatment; ovulation and luteinisation can be inhibited, and the endometrium is usually found to be in the resting stage. The breasts become smaller.

Two cases have proved refractory to treatment, even with large doses of testosterone propionate. No harmful effect however has been noticed in 16 patients treated during nine months with total doses up to 2200 mg.

I am indebted to Mr. H. L. Shepherd and Dr. Lily Baker for allowing me to treat their cases, to Dr. A. D. Fraser for sections, and to Messrs. Schering and Messrs. Ciba for samples of testosterone propionate.

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AN UNUSUAL CASE OF LEAD POISONING

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POISONING by lead taken for purposes of criminal abortion has often been reported—e.g., in the Nottingham case (1906)—and on other occasions, but the preparation of lead usually used was diachylon made up in the form of pills. Instances in which a soluble salt of lead has been employed appear to be less common. The effects of lead acetate are recorded by Ockerblad (1923), a lead lotion being erroneously taken internally. In Ockerblad's case 20 grains of lead acetate were ingested over a period of about two weeks, with resultant colic, anæmia, "lead line" round the gums, and hæmaturia.

CASE-HISTORY

A married woman, aged 25, whose previous health had always been good, was admitted to hospital complaining of general weakness, loss of colour, "pains in the bones," and attacks of severe abdominal colic associated with obstinate constipation. Her symptoms had lasted for six weeks, and in that time had become progressively worse. She also complained of a foul taste in her mouth and at times felt a sensation of numbness in her hands and feet. She stated that she had been pregnant for two months, but had had a complete abortion two weeks before admission to hospital. She admitted having taken "medicine" given to her "by a friend" during the second month of the pregnancy and it was subsequently found that this "medicine" was a solution of acetate of lead made up by adding about 70 grains of lead acetate to a pint of boiling water. In all she swallowed 1¾ pints of the solution over a period of a month, ½ oz. being taken three times a day during the first, second, and fourth weeks. As lead acetate is readily soluble in water and as the bottle was well shaken before taking a dose, it may be assumed that gr. 1·75 were taken three times a day and that, in all, about gr. 110 were ingested.

The following shows the history of symptoms and signs in the first week in relationship to the dose taken.

	Symptoms and signs.	Amount of lead acetate taken to date.
3rd day ..	Felt sick. Anorexia. Pains in the stomach.	.. gr. 12
4th day ..	Occasional vomiting. Constipation and griping pains. "Teeth started to darken" (?).	.. gr. 16
7th day ..	Colic, sickness, and vomiting worse. Pallor and "lead line" on gums noticed by husband.	.. gr. 37

The earlier symptoms are more significant, since, with vomiting, which started in the middle of the first week of ingestion of the drug, much of the lead acetate swallowed must have been returned in the vomitus. In spite of the severe symptoms of poisoning the patient stated that she carried on with regular doses up to the time of the abortion. In the second week, constipation, colic, pallor, and vomiting became worse, and in the third week, although no lead was taken, she felt so ill she could hardly stand. Abortion occurred at the end of the fourth week, when about gr. 110 of lead acetate had been taken. By this time she was completely exhausted, with severe colic and frequent vomiting. These symptoms persisted until admission to hospital.

CLINICAL EXAMINATION

On admission the patient was very weak and exhausted. She was emaciated, pallor of the skin and mucous membranes being pronounced, and the face having an ashen colour. There was a very obvious "lead line" round the gums and a blue-grey discoloration of several carious teeth was noted. The tongue was dry and coated with a grey metallic fur. Slight tenderness was present in the epigastrium. There was tachycardia with a V.S. murmur at the apex and base of the heart. Blood pressure 125/85 mm. Hg. The sclerotics were of a bluish tinge. Ophthalmoscopic examination showed no obvious changes apart from general pallor of the fundi. Knee-jerks and supinator jerks gave a very feeble response, but apart from these signs and the history of occasional numbness in the hands and feet there were no signs of nervous system derangement. At the time of examination there were no clinical signs of recent pregnancy or abortion. By the ordinary tests the urine was normal.

BLOOD EXAMINATION

The following results were found on examination of the blood: red cells, 2,270,000; hæmoglobin, 48 per cent.; colour-index, 1·09; reticulocytes, 2 per cent; white cells, 6800. Punctate basophilia, mostly of a coarse type, was observed in 2·5 per cent. of the erythrocytes—i.e., 56,750 stippled cells per c.mm.—and macrocytes and polychromatic erythrocytes were also seen frequently. There was considerable anisocytosis and a few normoblasts were present. A differential leucocyte count showed a slight rise in the lymphocyte class (32 per cent.). There was no increase in blood fragility. The van den Bergh reaction gave a positive indirect result. Wassermann reaction negative. A blood-lead estimation was not carried out on admission to hospital, but several estimations were performed later (vide infra).

Lead anæmia is usually associated with a low colour-index and a hypochromic blood picture, and the findings in this case appeared somewhat atypical. Davidson and others (1933), however, report a case

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of lead poisoning with a colour-index over unity and a macrocytic type of anæmia.

TREATMENT AND PROGRESS

Salines and enemata were given and the patient was put on a high calcium diet, as advocated by Hunter (1938) for the toxic episodes of lead poisoning. Calcium lactate gr. 15 t.i.d. was also administered. This treatment, which was well tolerated, quickly relieved the colics and as early as the third day clinical improvement was apparent. Later, when acute symptoms had subsided, the patient was switched to a low calcium intake in order to establish a negative calcium balance and on the fourth day of this diet a course of parenteral parathyroid extract was started. This form of treatment, described by Hunter and Aub (1927), increases the calcium and lead excretion in the fæces and urine, and has been termed "de-leading." Throughout the course of injections serum-calcium estimations were made as a control of treatment. Quantitative estimations of the amount of lead in the blood were also carried out—the method employed being that described by Tompsett and Anderson (1935), who showed that the average content of lead in the blood in a series of unselected hospital patients and normal individuals was 55 μg per 100 c.cm. The parathyroid preparation used was Parathormone (Lilly) given intramuscularly. Smaller doses than those usually employed were used—owing to the acute symptoms having been fairly recent. It has been stated by Hunter and Aub that parathyroid treatment is of greatest value in removing lead which has been recently laid down in the bones.

In all, 240 units of parathormone were given in the first course with a resultant rise in both serum-calcium and blood-lead content (see Table). That the dose had caused a toxic amount of lead to have been withdrawn from the bones was shown by the fact that the patient had a return of colic at the end of the course. This was quickly and dramatically

DETAILS OF FIRST COURSE OF PARATHORMONE

Day.	Units of parathormone.	Serum-calcium. mg. per 100 c.cm.	Blood-lead content. μg per 100 c.cm.
1	20	8·8 (before injection)	200
2	20	9·0	..
3	20	..	..
4	40	9·5	..
6	40	..	..
7	40	10·3	..
9	40	..	..
10	20	..	..
11	..	11·9	230

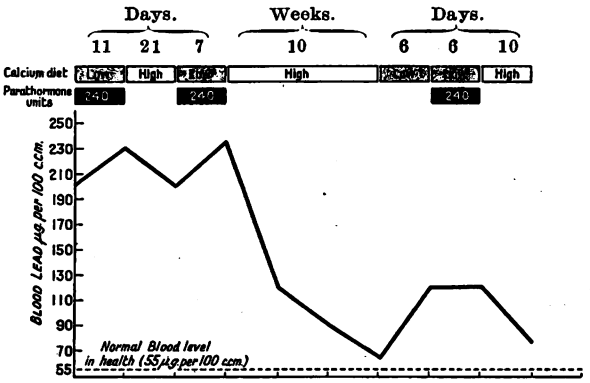
The urine showed an increase in calcium content throughout the course as compared with the content when on a low calcium diet alone.

relieved by an intravenous injection of calcium gluconate and a subsequent high calcium diet.

Following the course of parathormone the patient showed considerable clinical improvement, feeling much stronger. The anæmia proved stubborn to treatment with iron alone, given orally, and, although no associated reticulocyte response was shown, combined treatment with liver injections and oral iron caused an improvement in the blood count.

The patient having been on a high calcium intake for three weeks after the first course of parathormone, a negative calcium balance was again established and another course of 240 units was given. This was well tolerated—the blood-lead content rising from 200 to 235 μg per 100 c.cm (see Chart). There was only a slight rise in serum-calcium on this occasion, namely, from 8·8 to 9·8 mg. per 100 c.cm. Hunter and Aub showed that parathyroid did not usually increase the serum-calcium when a second course was given, a type of "immunity" to the hormone being developed. In their cases, however, the first course was longer and larger doses were employed.

Clinical improvement again followed this second course and the patient was subsequently placed on a high calcium intake. A progressive fall in the blood-lead content was associated with this treatment (see Chart). By this time, over two months after admission, the patient was well enough to get up for short periods. She was gaining weight and her colour was improving. There was still a slight



Influence of parenteral parathyroid and calcium content of diet on the blood-lead level in patient with lead poisoning, with the average level in health.

"lead line" round the gum margins. Blood count figures at this time were: red cells, 3,070,000; hæmoglobin, 63 per cent.; colour-index, 1·03; white cells, 6400. Blood films presented a fairly normal appearance, stippled erythrocytes being seen only very occasionally.

She was dismissed from hospital 10 weeks after admission, with instructions to continue on a high calcium diet. She was still having iron orally and liver extract injections weekly.

Two months later she was readmitted to hospital for further investigation and was placed on a low calcium diet. A further course of 240 units of parathormone was given. On this occasion there was no increase in the blood-lead content following the injections. It was of interest to note that the blood-lead level rose from 65 μg when on a high calcium intake to 120 μg per 100 c.cm. when on a low calcium intake. After returning to a high calcium diet following the course of parathormone the blood-lead level again fell to 75 μg per 100 c.cm. By this time blood count figures were: red cells, 3,880,000; hæmoglobin, 77 per cent.; colour-index, 1·0; white cells, 6100. No stippled cells could be demonstrated after repeated examinations, the erythrocytes appearing normal in shape and size.

Clinical examination of the patient was satisfactory. The "lead line" had disappeared. Blood pressure was 125/95 mm. Hg. By the ordinary tests the urine had been normal throughout. Her colour had greatly improved and menstruation had now returned. Her bowels were regular. She stated that she felt in normal health.

SUMMARY

1. A case is described of severe lead poisoning in a woman after the ingestion of 110 grains of acetate of lead, taken over the period of a month for purposes of criminal abortion.

2. Hæmatological data, some points of which appeared atypical, are recorded.

3. Results of "de-leading" measures using parathyroid extract parenterally are given and the

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effects of the use of the extract and varied calcium intake on the blood-lead content are described.

Our thanks are due to Dr. John Reid and Dr. J. Norman Cruickshank for facilities given for the study of the case and also to Dr. W. M. Ford Robertson for the serum-calcium estimations.

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PREVENTION OF COMPLICATIONS DURING GOLD THERAPY IN TUBERCULOSIS AND ARTHRITIS

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IN recent years gold preparations have been extensively used in the treatment of joint diseases, showing, no doubt, that they are a really effective remedy where one was especially needed. The old methods of physical and medicinal treatment yield but small results, and the rheumatic diseases make such large demands on the disablement pay-roll that any advance is welcome. Gold therapy was originally used in tuberculosis, and was extended to joint affections, according to Forestier, on the theory that it acted on streptococci. I have used it on the hypothesis that there is a connexion between joint diseases and tuberculosis.

In both groups of diseases the gold preparations cause certain symptoms which impede their widespread use. Any attempts at preventing these reactions will depend upon how they are interpreted. The opinion of the majority is that they are due to metal poisoning, and they are usually described as gold intoxication. If this is so, treatment or prophylaxis will be difficult and it will be inexcusable to use gold preparations further in a patient who has shown such symptoms. We are here dealing with very varied and complicated compounds, some of which may undoubtedly be dangerous.

My own experience with gold treatment goes back to 1923, when I introduced the Danish preparation Sanocrysin (Möllgaard) in my clinic, and I have since used this preparation constantly, having first-hand knowledge of the chemical and animal control of its production. I have always opposed the theory of metal intoxication, and have maintained that the reactions are due to toxins liberated from the lesion itself. My reasons include the following:—

(1) Reactions or complications after administering gold salts depend primarily upon the anatomical conditions present. In closed cases (pleurisy, fibrous tuberculosis, joint affections), where there is a likelihood of the absorption of liberated toxins, severe reactions such as rise of temperature and erythemas appear only in the first stages of treatment. Reactions, then, do not depend upon the total amount of metal injected, but upon the individual dose. In open cases expectoration provides drainage which prevents severe intoxication, and patients with open lesions may be given larger doses.

(2) Gold salts may give rise to conjunctivitis and phlyctenas. But phlyctens can only be evoked experimentally by injecting sanocrysin into tuberculous animals (Edmund 1935).

(3) The erythema nodosum and other erythemas seen after giving gold salts are also seen in tuberculous patients apart from treatment.

(4) In tuberculous persons injection of gold salts may be followed by a hyperglycæmia (Bording and Secher 1929), analogous to that which follows injection of bacterial toxins, especially tuberculin.

PROPHYLACTIC USE OF VITAMINS

Whereas in tuberculosis gold treatment is now generally uneventful, difficulties arise in patients with joint diseases, presumably because of their sensitiveness to liberated toxins. To overcome this I now aim at increasing their resistance by energetic treatment with vitamins A, B, and C.

The vitamin supply of civilised man is so small that he is badly equipped to meet special demands on these substances. Not only in Denmark but in other countries where investigations have been carried out latent vitamin deficiencies have been found in asylums and other institutions and in the population in general, more particularly those deficiencies characterised by affections of the skin, mucous membranes, and eyes. Lack of vitamin A may be responsible for keratomalacia and hemeralopia, keratosis of the skin, stomatitis, and abnormalities of the nasal mucous membranes. In recent years, following the observations of Hess-Thaysen, research has shown that vitamin-B deficiency is more important than was imagined, and cases of pellagra with affections of the skin are comparatively common. Intestinal diseases, even sprue, are sometimes caused by vitamin-B deficiency, which is also a factor in the production of keratitis. In the present connexion vitamin C is no doubt of special importance, not only for its effect in infections, including tuberculosis, and in scurvy, purpura, and thrombopenia, but also because it has been found to be deficient in rheumatic fever and polyarthritis.

This reference to the action of vitamins in producing symptoms similar to those which accompany sanocrysin treatment will explain why it is reasonable to attempt to counteract these symptoms by giving large doses of vitamins. Since September, 1936, I have given preparations containing the following daily to all tuberculous and arthritic patients receiving sanocrysin:—

Vitamin A: 20,000 international units.
Vitamin B_1: 750–1500 I.U.
Vitamin B_2: 375–750 Krieger Lassen units.
Vitamin C: 2500 I.U.

The dosage is three or four times that which is generally considered the normal demand. This treatment should be begun a few days before sanocrysin is given. The results so far have been excellent; the general condition of the patients has been much improved, and there have been no difficulties of any kind in the 150 patients treated.

SPECIAL COMPLICATIONS

Various investigators have described a long series of reactions or complications accompanying gold treatment and have used these terms indiscriminately according to the significance they have attached to them. Thus in my opinion an erythema is a desired reaction and a sign of the efficiency of the treatment, whereas to others it is a complication. Various reactions during gold treatment, such as agranulocytosis and neuritis, have been described, but are extremely rare. The only reactions I have found troublesome are thrombopenia and dermatitis. These will now be considered separately.

(1) *Thrombopenia.*—After the introduction of sanocrysin treatment in joint diseases attention was quickly

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focused on the thrombopenias and we observed three severe cases with one death. This was the more remarkable as in about 700 tuberculous patients treated I have seen only a single case. A number of other workers have reported this reaction. Heinild (1937), however, in my department has proved clinically and experimentally that the gold does not injure the hæmopoietic system. Fever during infection is associated with a decrease in the number of thrombocytes; so by making a count at a suitable time we may be deluded into thinking we are dealing with an effect of sanocrysin. Furthermore, a thrombopenia may be an allergic reaction to liberated toxin, and if these reactions are coincident the combined effect may be dramatic. This reaction thus confirms my conception of the intoxication. I have had no case of thrombopenia since the introduction of vitamin treatment.

Eosinophilia has been widely discussed, and has been used as a control of the course; but I have not been able to ascribe any special importance to it and have certainly not found it useful as a guide in treatment, since it appears too late.

(2) *Dermatitis.*—From the earliest days of gold therapy the exanthemas and erythemas have attracted attention, and it was because of them that the hypothesis of gold intoxication arose. In the following cases of rheumatic polyarthritis exanthemas appeared after quite small doses.

CASE 1.—A woman aged 51. She had had "rheumatism" in her left wrist when she was 6 and the joint had since been stiff. For 14 years she had had pains in the joints and in the last 2 years had been treated three times with X rays, without effect. She had kept to her bed for the last three months. When admitted to hospital in March, 1937, she had considerable limitation of movement in her elbows, wrists, and left knee, and both knees were swollen. Her temperature was normal. Pirquet's reaction negative; Möllgaard positive; sedimentation-rate 46. She was given vitamin therapy from March 21st. On April 6th she received 0·35 g. of sanocrysin and half an hour later complained of pains in various joints, especially the elbows, and there was reddening of the finger-joints, and injection of her conjunctivæ. Her temperature rose to 39·1° C. that evening and she had a severe night-sweat. In the following four days her temperature ranged from 37·6° to 38·6° C. and by April 10th her pains had entirely disappeared. On April 12th her temperature rose to 39·1° C. and a typical rash appeared which lasted for about two weeks, then developing into a mild dermatitis. Her eosinophils were as follows:—

April	6th	.. ..	Eosinophils	1 per cent.
„	16th	.. ..	„	8 „
„	30th	.. ..	„	51 „
May	11th	.. ..	„	16 „
„	20th	.. ..	„	12 „
„	25th	.. ..	„	10 „

When she was discharged on June 5th she had no pain and her sedimentation-rate was 8. The eosinophilia, to which I do not attach any special importance, is evidence of a "biological immunity" reaction, and in my opinion the conjunctival reaction lent support to my theory of liberated toxins.

CASE 2.—A woman aged 66. She had had pains in a number of joints for six months and had been confined to bed for nine weeks. On admission on March 21st, 1937, she had swelling and limitation of movement in all the joints of her fingers, in her knees, ankles, wrists, elbows, and shoulders. Pirquet and Mantoux negative; Möllgaard positive; sedimentation-rate 26. She was given 0·25 g. of sanocrysin on April 2nd and again on April 5th. A rash appeared on April 10th with pyrexia. After the reaction she had an eosinophilia of 11 per cent. She was allowed up on May 5th. On her discharge on May 22nd her finger-joints, knees, wrists, right elbow, and left shoulder were still swollen but she was able to walk about and could comb her hair and clench her fists. She had no pain except on drawing a deep breath. Her sedimentation-rate had fallen to 20.

CASE 3.—A man aged 25. He had had transient joint pains a year before. The present attack began a month before admission with pain and swelling of the joints of his feet, ankles, and knees, which steadily got worse. A week before admission he had pain and swelling of his finger-joints, elbows, and shoulders, but he had continued at work. On April 11th, 1937, when he was admitted to hospital, there was only a small degree of lessened mobility of his affected joints. Pirquet and Möllgaard positive; sedimentation-rate 25. His temperature was normal but he was in constant pain. On May 19th he was given vitamin therapy. His sedimentation-rate was then 34. On the same day he received 0·35 g. of sanocrysin which was followed by a rigor and a rise of temperature to 40° C. A rash appeared on the following day and lasted four days. On May 21st he developed stomatitis. On June 1st he received a further 0·5 g. of sanocrysin which was followed by smarting of the eyes and itching of the skin, and some injection of the fauces. His pains were very much less by June 8th. On the 9th he had 0·20 g. of sanocrysin and on the 15th a further 0·35 g. both with no reaction. He discharged himself against medical advice on June 24th. He then had no pain but his sedimentation-rate was 73.

The erythemas sometimes develop into forms of dermatitis which may be very severe and even lead to death from sepsis. Since the introduction of vitamin treatment I have seen two cases, both mild, and possibly due to sanocrysin being started too early. Time must be given to build up the vitamin store of the body before injections are begun. If this is done vitamin treatment seems to protect the patients against complications.

SUMMARY

The reactions provoked by sanocrysin (gold) therapy are attributed to liberation of toxins from tuberculous or rheumatic lesions.

They may be prevented or checked by giving large doses of vitamins A, B, and C before and during treatment.

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Clinical and Laboratory Notes

ANEPHROGENESIS

BY D. E. PRICE, M.B. Lond.
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CONGENITAL absence of both kidneys and ureters, in the absence of other gross congenital defects, is an extremely rare condition, and should render this case of sufficient interest to be placed on record.

Rosenbaum (1931) first discussed the condition in a series of 91 cases, extending over a considerable number of years, all of which showed maldevelopment elsewhere in other organs. Bates (1933) published 2 cases of his own, and collected 5 others, in mature

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and viable fœtuses and associated with oligohydramnios. Gowar (1935) reports a case similar to ours in which a child, accompanied by a normal amount of liquor amnii, survived for an hour after delivery.

A woman, aged 30, presented herself at the antenatal department at approximately the twenty-eighth week of her second pregnancy. She had one normal child, weighing 7½ lb. at birth.

Examination.—She was healthy, her urine was normal, and the blood pressure within the normal range—110/80 mm. Hg. The fœtal heart was heard beating strongly, with a normal rate and rhythm. Further examination, at the thirty-second and thirty-sixth week, confirmed the findings of the previous examination, the urine remained free from abnormal constituents, the systolic pressure rose slightly to 132 mm. Hg, but the diastolic fell slightly to 75 mm. The presentation was a vertex in the left occipito-anterior position and the pelvis was roomy.

Delivery.—Soon after the last examination she was admitted in labour—i.e., approximately four weeks

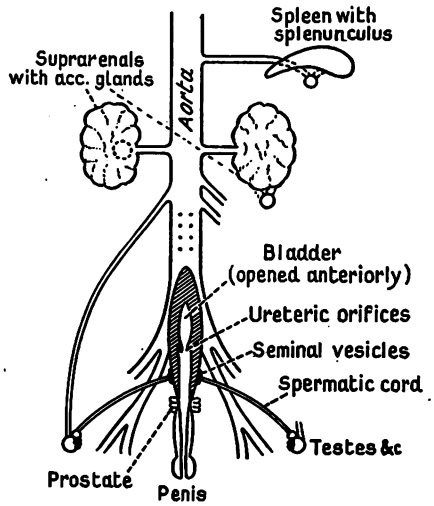

Diagram of urogenital system and vessels.

before the expected date of delivery. After nine hours in the first stage she was delivered, easily, of a living male infant weighing 5 lb. 4 oz. The second stage was accompanied by the passage of an apparently normal amount of liquor and the perineum remained intact. The third stage and puerperium proceeded normally.

Examination of the placenta showed very little infarction and numerous small white nodules, about 3 mm. in diameter, in the membranes on the fœtal surface. These nodules were insoluble in fat solvents and proved histologically to be small nodules of fibrin, showing slight necrosis in the centre and early organisation at the periphery. In places there was destruction of the amniotic cells covering the surface of the nodules.

Immediately after delivery the child appeared very cyanosed, shocked, and limp. He was treated with heat and the mucous catheter. Inhalations of a mixture of 95 per cent. oxygen and 5 per cent. carbon dioxide were given to stimulate respiration and ½ c.cm. of Lobeline was injected into the umbilical vein. Obvious respiration commenced within 25 minutes of delivery, but the child did not cry in the usual healthy manner. Breathing consisted of shallow gasps at irregular intervals. Regular breathing was never properly established and oxygen was administered continuously. Although the cyanosis lessened the child remained a dusky hue until he died three hours after delivery. During this time the muscle tone improved but was never completely normal, and although meconium was passed, no obvious urine was excreted.

Post-mortem report.—The body of a well-nourished premature infant. The thoracic organs, as a whole, sank in water, individually the left lung floated but the right sank. The right lung was plum-coloured with slight aeration along the fringes. The right and left ventricles of the heart were equal in size, the foramen ovale and ductus arteriosus were patent. The vascular system appeared normal, the suprarenal vessels passing from the aorta and inferior vena cava at the usual sites to the hila of the glands. The spermatic vessels entered the main trunks on both sides. The alimentary system showed nothing relevant, the liver being fatty at the periphery of the lobules. A small splenunculus was found in apposition to the hilum of the spleen. The kidneys and ureters on both sides were absent. In consequence of this the suprarenal glands, represented by two flat, semilunar discs of about normal size, showed altered anatomical relationships (see Figure). The external poles had undergone a downward and internal rotation, so that the inferior or renal border in the normal organ was presented to the aorta and became the internal border. Two small nodules, approximately 3 mm. in diameter, were found; the first was in apposition to the posterior surface of the hilum or aortic border of the left gland, the second attached to the inferior pole of the right gland. These were thought at first to be kidney remnants, but on microscopy proved identical with suprarenal cortex. The bladder was represented by a fibromuscular tube, continuous above with a non-patent urachus and below with a patent urethra. It contained no fluid. Papillæ were found in the bladder at sites corresponding with the normal ureteric orifices. These were patent for a distance of about 1 mm. No flaps were seen around the verumontanum. The remaining systems were normal.

A case has been described of anephrogenesis with complete absence of ureters in a child surviving for three hours. In addition the following points are of interest: (1) normal amount of liquor amnii; (2) slight amniotic inflammation; (3) accessory nodules of splenic and suprarenal cortical tissue; (4) no left ventricle hypertrophy. Cases of this nature have been excellently discussed by previous authors and no useful purpose is served here by recapitulation.

We are greatly indebted to Prof. W. D. Newcomb and Mr. A. W. Bourne for allowing us to publish this case.

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A NOTE ON THE ACTION OF CONCENTRATED SULPHURIC ACID ON VARIOUS TYPES OF HAIR

By D. P. Lambert, M.D. Edin.
MAJOR, I.M.S.

When human head hair is treated with concentrated sulphuric acid and observed under the microscope the outer fibrils of the hair are the first to be attacked. They become partially separated one from the other, giving the hair a shaggy appearance. Here and there the hair edge acquires a wavy outline. After ten minutes this action is very evident and an intact central core can be seen with a shaggy margin on either side. The core occupies about a third of the diameter of the hair, and surrounds the medulla if a medulla is present. If heavy pressure is now applied to the cover-glass the core resists, but the edges are flattened out, many fibrils being completely

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separated whilst others remain in sheaves and bands. By manipulation the core can be freed from the outer fibrils. With prolonged action of acid and further pressure the core can be reduced to individual fibrils similar in all respects to those of the outer sheath: but the fibrils of the core seem to have more cohesion, do not split off so easily, and tend to be arranged in long bands which look like raffia under the 8 mm. objective. Moustache hair, axillary hair, pubic hair, and thick body hair behave very similarly, but are much more resistant to the action of acid, probably because of their greater thickness; for, with head hair, thin hair seems less resistant than thick. Infants' hair behaves like thin adult hair.

Animal hairs so far tested, except those of the apes and of the dog and wolf, show much less resistance to the action of acid and pressure. The species examined were sheep, horse, cat, ferret, rabbit, guinea-pig, rat, mouse, cheetah, polar bear, syrian bear, American bison, and arctic fox. Most of these if examined soon after the acid has begun to act show more or less shagging of the margins, but on applying pressure after ten minutes their structure is almost completely destroyed. This destruction is accompanied by much evolution of gas, presumably from the action of the acid on the cells of the medulla.

Ferret hair shows a peculiarity not duplicated in any hair so far examined. After allowing the acid to act for five minutes and manipulating the hair the outer fibrils can be made to stand out like the barbs of a feather.

Dog hair shows a core like that of human hair but not so resistant to pressure. Further the fibrils of the outer layers show less cohesion and are stouter than those of human hair. Wolf hair behaves like dog hair, but is thicker and compares with dog hair as moustache hair does with human head hair.

Chimpanzee hair and gorilla hair behave very like human hair. Possibly the core is less resistant than that of human hair, but accurate measurements of pressure would be needed to determine this. Orang-utan hair shows a core but very little outer shagging; instead a clear zone develops, which flattens out on pressure with very little separation of fibrils. In white-handed gibbon hair a fine core is present, less resistant than that of human hair; the outer fibrils are very large and distinct, and have little cohesion.

It will be necessary to extend this work to many more animal species, and to devise means of applying accurately measured pressures. The range of variation in the resistance of human hair can then be determined and strict comparisons made with ape hair and with other resistant animal hairs that may be found.

I am indebted to Mr. T. H. Gillespie, director of the Scottish Zoological Park, for specimens of animal hair; to Prof. A. R. Moritz of Harvard for the sample of gorilla hair; and to Prof. Sydney Smith for the hospitality of his laboratories.

BLOOD PRESSURE IN SCARLATINAL NEPHRITIS

By R. Workman Carslaw, M.B. Glasg.

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"Further investigation to decide the time relation of albumen and hypertension in post-scarlatinal nephritis would be highly desirable" (Fishberg 1934). According to Kylin (1926) a rise in blood pressure precedes the nephritis by some three to four days. Gram (1936) thought that the majority of scarlatinal patients have a latent nephritis. Lastly, Bayart (1933) found a rise in blood pressure in the third week in a number of cases and in the majority this was followed by nephritis.

INVESTIGATION

It was decided to investigate the blood pressure in a series of 50 cases of scarlet fever during the first three weeks of illness. It was found that the cases could be divided into four groups, according to the date of the rise in systolic blood pressure (see Table).

INCIDENCE OF RAISED BLOOD PRESSURE AND ALBUMINURIA IN 50 CASES OF SCARLET FEVER

Group.	Date of rise in pressure.	No. of cases.	No. with albuminuria.
I	Third week.	8	3
II	Second and third week.	7	2
III	Second week.	12	5
IV	Nil.	23	12

If one examines the cases from the aspect of renal lesions, the earliest sign is albuminuria. This may be febrile or functional, or due to pathological renal changes, &c. Albuminuria in the first week of illness has been ignored since it is possibly febrile. Later in the illness it is the only renal sign whether it arises from true nephritis or not.

The Table shows that 27 of the whole series had a rise of pressure in the second or third weeks and 10 of these cases had albuminuria at some period, but in only 6 did the albuminuria follow the rise in pressure. Of the 23 that had no rise in pressure 12 had albuminuria. It is therefore evident that a rise in blood pressure does not necessarily predict albuminuria nor does albuminuria mean that the blood pressure will be raised. The pressure rose in 17 of the 28 without albuminuria—i.e., with no apparent renal trouble. Of the 22 cases with albuminuria 16 were not preceded by a rise in systolic blood pressure. Can we therefore assume a relationship between raised blood pressure and albuminuria?

In the 50 patients 3 developed clinical nephritis. In only a single case was there a rise in blood pressure, and this occurred after the appearance of hæmaturia.

CONCLUSIONS

1. The systolic blood pressure in scarlet fever is very variable. Albuminuria is a very common sign in the disease.

2. There is no rise in systolic blood pressure at the critical period, nor is it possible to diagnose an early post-scarlatinal nephritis by daily blood-pressure readings. If there is a prenephritic rise in blood pressure it must be very slight and transient.

I wish to thank Dr. T. Archibald for permission to carry out the investigation.

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MEDICAL SOCIETIES

ROYAL SANITARY INSTITUTE

AT a meeting of this institute held at the Perivale Maternity Hospital on April 21st, the chair was taken by Prof. J. M. MUNRO KERR, and an opening paper on the

Planning of Hospitals

by Mr. L. G. PEARSON, F.R.I.B.A., was read by the secretary. Mr. Pearson said that in planning to start a hospital the plan of the wards might well be shaped first, as it gave the key to the lay-out. The old idea that wards must always have a north and south access and windows spaced at eight-foot centres down each side was now considerably modified. The side-lighted ward with beds placed parallel to the window wall had proved a good alternative, but attention must also be paid to the corridor side, by the provision of fanlights, borrowed lights, and so on, if cross-ventilation was to be preserved. The corridor itself must also be well lighted and ventilated. Cross-ventilation was difficult to secure. With modern methods of antisepsis and electrical light and ventilation, the medical man did not insist so strongly as in the past on the old arrangement, but good natural light and ventilation to every part of a hospital would always be the aim of the designer.

Electric lifts had made a more concentrated form of planning possible, but the approach to them and their position became most important. Direct access and ample turning space on the upper floors must be provided, and noise from the lift motors must be eliminated. The placing of a maternity block close to but separate from a general hospital ensured separate entrances and isolation. The ceiling-panel system of low-pressure hot-water heating had proved successful in many hospitals and provided a good alternative to the ordinary radiator. It suffered, however, from the time-lag defect and was not so flexible. Simplicity in working and economy in running of a hospital would always be the first considerations.

Dr. JAMES FERGUSON spoke of the planning of the general hospital. He said that the requirements of Surrey were 2·5 beds per thousand of population, and a new hospital of 860 beds was being built for the suburb of St. Helier. Within the next five years 1500 new beds would be available. The architect should if possible be appointed before the site was chosen, and should be a specialist. The doctor could exert most influence at the stage of sketch plans. The most favourable position should be chosen for the wards, with the best aspect and the least external noise. The lines of internal communication should be carefully situated and undue distances between interrelated parts avoided. At the St. Helier hospital the chief centres of internal noise—the lifts, staircases, and main service corridor—had been kept as far as possible away from the wards themselves. The lay-out of a hospital depended largely on the size and composition of the ward unit: the group of beds under one sister. This unit should contain as many beds as a sister could supervise and yet give individual attention to each patient. The figure suggested by the departmental committee on hospital costs was 30. The first question in planning a ward unit was whether a system of large or small wards should be adopted. There was a general tendency to subdivide the unit into a number of relatively small wards—in England not more than 16 beds. In the St. Helier hospital the ward unit was divided into one ward of 18 beds, two wards of 4 beds, and four single wards. If the corridor system were adopted, the wards should not be more than 2 beds deep, or lighting and ventilation would be inadequate. A longitudinal arrangement of the beds allowed one or both sides of the wards to be composed mainly of windows, so that patients could be nursed in practically open-air conditions. The committee had said that this arrangement did not appear likely to affect constructional costs materially, but might involve additional expense in working. Wards should be between twenty-four and twenty-six feet wide, and the centres of the beds should be eight feet apart. The ancillary rooms should be so arranged that carrying and walking were reduced to a minimum. The balance of advantage in economy and convenience was in favour of the high against the low building. It was vital to provide some degree of luxury in the nurses' quarters. Each nurse must have a bedroom to herself, and senior nurses either a bed sitting-room or two rooms. Ample provision must be made for recreation both in the home and outside.

Dr. THOMAS ORR, in a paper on the planning of

MATERNITY HOSPITALS

said that the first important factor in design was the prevention of puerperal infection, the second the importance of providing antenatal care for those women who needed it. The tendency had been to lessen the population of wards and to provide a much larger number of single-bed wards. The Departmental Committee on Maternal Mortality and Morbidity had advocated, for the optimum of safety, a hospital with 50 or 60 maternity and 5 to 10 antenatal beds. A maternity hospital of less than 20 beds could not afford the responsible staff which was necessary to maintain skilled supervision, for an experienced medical officer must be directly in charge. A much larger hospital could be efficiently run if it were divided into units. Dr. Orr did not agree with the committee in their advocacy of maternity accommodation at general hospitals on the ground of economy. Moreover, the need of facilities for specialised treatment was very small. A radiological department was used before the patient went into hospital and not afterwards, and a laboratory service could always be obtained apart from a general hospital. The strong arguments in favour of an entirely separate institution were that the normal maternity patient was not a sick woman, and that separate housing must be provided for the nursing staff attending maternity cases, to protect them against infection from the general nurses and to facilitate the control of possible carriers among the nursing staff.

The ward block of the Perivale Maternity Hospital consisted of two floors, each with two units. Each of these consisted of one 6-bed ward and four single-bed wards, a sluice room, bathroom, and closet accommodation. The intention was to keep the mothers, after confinement, in the single-bedded wards for the first three days, the time during which most complications arose. The single-bed wards were also used for abnormal cases, except those with a rise in temperature, and for antenatal cases. The proportion of single wards had not been found too high. They had windows in their partition walls for supervision and to prevent patients from feeling lonely. A view of persons passing along the corridor was irritating

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to patients, and so no window was placed in the corridor wall. All the wards had a south aspect. The design allowed extensions from the ends of each corridor, in the form of groups of small wards or of large wards as might be thought desirable. Each unit would ultimately have 14 or 16 beds, with the existing proportion of single-bed wards. The heating was by radiators of the hospital type with concealed pipes, and the floors were of oak strips. The labour block was separated from the ward block by a long corridor, and had an admission room, a bathroom, and an examination room which could be used as a delivery room. On the north side of the corridor were an operating theatre and two delivery rooms. The block was built so that more delivery rooms could be added. They faced north and were well away from the ward block. If a woman arrived too early she was placed in a single-bed ward until the first stage was passed, when she went to a delivery room. No separate section had been allotted to antenatal cases, which were admitted to single-bed wards. It seemed desirable to keep them separate, as they varied greatly in character and the demand for antenatal treatment was irregular. In a separate block 3 isolation beds were provided, but puerperal cases were sent to the isolation hospital. The antenatal clinic had better be in a position convenient for patients, but the staff should be identical with that of the hospital.

DISCUSSION

Prof. J. A. DOULL (Western Reserve University, Cleveland, U.S.A.) said that his hospital delivered about four thousand women a year. The patients were carefully selected by six antenatal stations. It also held antenatal classes for patients of private physicians. The fee was two dollars and the numbers were rapidly growing. No member of the class had died during the past year. Syphilis had declined slightly in the last few years among white women and young coloured women, but had increased among older coloured women. The incidence in coloured women was 10 to 12 per cent., as against the 2 per cent. of the white women. It constituted a serious problem.

Mr. A. SAXON SNELL, F.R.I.B.A., declared that the greater the experience of the hospital architect the more he appreciated the coöperation of the highly competent medical man. The site of the St. Helier hospital was small, but had open spaces on three sides. It fell a few feet from south to north, so that the ground level for the administrative and service buildings was lower. No connecting corridor had been made, but subways joined all the blocks, so that space and air were not interfered with. Building in height must be more economical than building over a large area.

Dr. G. F. BUCHAN doubted whether, in view of the changing conditions of the nursing service, the size of a ward unit could depend entirely on the capacity of the sister. It must be affected by the number of nurses employed and the hours of their employment. He could not agree on the necessity for having a maternity department attached to a general hospital. If a woman required specialist treatment, the specialist had to come to her, and it did not much matter where she was. There were advantages in the elasticity given by a large proportion of single wards. Isolation beds should be provided for women suffering from tuberculosis or such conditions as discharging ear, and for infection contacts. Isolation beds were therefore convenient for a large number of cases, the existence of which might be overlooked in the planning of the hospital. The antenatal clinic should be near the woman's home and not necessarily in the hospital grounds, but the staff of the hospital must be associated with it. The important part of the hospital was not the building but the running, and most women would rather be delivered by a competent obstetrician under inferior conditions than vice versa. Local authorities might well spend more money on competence than on building.

The PRESIDENT related that when the Glasgow Maternity Hospital had been projected thirty years ago, the senior obstetricians, the architect, and an expert in hospital construction had been sent on a tour of continental hospitals and had made careful notes. On their return, the medical officers had made detailed plans of the medical requirements. The comparison with existing methods had been found most useful. There was great advantage in the appointment of a visiting physician to antenatal wards to examine women with cardiac, renal, and other complicating conditions. It was advantageous to be able to bring the physician from an adjoining general hospital rather than cause him to make a special journey. Without antenatal beds, a hospital could not train midwives in antenatal care. He preferred single labour rooms, in which the patient could be placed at the onset of labour and left until it was over, unless she had to be taken into a special delivery room. The effect of sedatives was much greater if the woman were not disturbed. The efficiency of the staff was of prime importance, but simplicity of design helped simplicity of staffing. The ideal arrangement was that of the Rotunda, where a master and assistants carried on the work. The size of the hospital was immaterial; the important factor was the arrangement. Hospitals of 400 beds were efficiently run in Vienna under a resident superintendent. The admission block of a maternity hospital dealing with emergencies was very difficult to design. Cases of all kinds passed through it: suspects, possible septic cases, emergencies in the middle of labour, early and "clean" cases. There should not be separate institutions for clean and for emergency cases, but the main maternity hospital should have a block for emergencies, which should never pass the ordinary admission block at all. The labour room section should consist of single rooms with a delivery room for operative cases, associated with a "battery" of about fifty wards, with five or six labour rooms. By this means the number of women going to each section would be cut down. The method of concentrating all the women into one labour block was very dangerous. By the other arrangement, a case of infection could instantly be traced and contacts isolated. It was a great mistake to put all difficult cases into the suspect block. The source of infection in that type of case was often an anaerobic and not a hæmolytic streptococcus. They were not nearly so dangerous as the catarrhs, influenzas, or sore-throats, which should be carefully isolated. Emergencies should be dealt with in a separate block of wards with its own labour room. Abortion cases might well be sent to an institution, without the maternity label, such as an isolation hospital.

The increase in the numbers of women attending maternity hospitals was very marked, and he hoped that some day every maternity case would be treated in an institution. Local authorities must obviously design hospitals with a view to extension.

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REVIEWS AND NOTICES OF BOOKS

Chemistry of the Brain

By IRVINE H. PAGE, A.B. (Chem.), M.D., Hospital of the Rockefeller Institute for Medical Research, New York. London: Baillière, Tindall and Cox. 1937. Pp. 444. 34s.

THE increasing tendency to apply biochemical methods to the study of mental disease has led to closer investigation of the chemistry of brain substances, well begun by Thudichum between 1865 and 1885 and since neglected for many years. Modern methods have greatly extended the scope of measurement of brain metabolism, and although it is not yet possible to construct an orderly plan of the sequence of events, at least we are familiar with many of the enzyme systems concerned.

Both aspects of this subject are on the whole well described in this book, which will be of value to an increasing number of specialists. It has certain defects. One is that too much space is devoted to general biochemistry, without special reference to brain or nervous tissue. The fact that the brain consists largely of sterols is hardly sufficient reason for a discursive chapter of 40 pages on these compounds, of which four or five deal with brain sterols in the narrow sense. Another defect is that the editing and arrangement of the material have not been done with such care as a complicated theme demands, and there is duplication of material in several places. Nor is the detail unassailable. The formula given for benzpyrene on p. 12 is that of dibenzanthracene, and those of adrenaline and reduced coenzyme (pp. 112 and 180) need clarifying.

One of the most valuable sections of the book is that on the phosphatides and fatty acids; their metabolism in brain and nervous tissue is fully discussed. In dealing with the carbohydrates Dr. Page adopts an entirely different pattern from that which governs his discussion of the sterols and lipins. He omits all description of the structure of the compounds and plunges straight into the various schemes of carbohydrate oxidation. In his account of the Embden-Meyerhof scheme he might well have drawn more attention to the rôles of magnesium ions and cozymase; he tends to give the impression that the scheme is one of oxidation whereas it was originally devised for the explanation of the lactic acid formation. This section is largely based on Meyerhof's 1933 article in *Nature* and might have been brought more up to date by reference to various excellent reviews in the *Ergebnisse Enzymforschung*. It is astonishing to find no reference to the important views on carbohydrate oxidation of Szent-Györgyi and his school (1934 to date); certainly Dr. Page's preface is dated 1936, but this work was well recognised even at that time. The section on glyoxylase could quite well have been written in 1931; no mention is made here of the rôle of glutathione as coenzyme to this system, although this is noted (p. 169) under quite a different heading. The reference to the excellent research of Gerard and others on nerve metabolism is only indirect. The space given to the N-metabolism of brain is meagre, and here a serious omission is that of the interesting discovery by A. Fölling in 1934 of the excretion of phenylpyruvic acid, presumably formed from phenyl alanine, in the urine of certain feeble-minded children—a condition called by its discoverer imbecillitas phenylpyruvica. J. H. Quastel has supplied an admirable chapter on oxidations in the brain, the older work on this subject having been surveyed by Dr. Page in the main body of the book.

The reference throughout the book to original sources is one of its good features, and it is encouraging to realise how many notable advances have been made since its completion. These include the discovery of the relationship of vitamin B_1 to cocarboxylase, of the probable functions of nicotinic acid, and of the formation of acetylcholine in surviving brain tissue. All this work will be entitled to explanatory notice in Dr. Page's next edition, and we hope much more will have reached this stage by the time it is needed.

Les hémorragies utérines avant et après la ménopause

By CLAUDE BÉCLÈRE. Paris: Masson et Cie. Pp. 210. Frs.50.

THIS book gives much information about menopausal hæmorrhage, but announces the existence of "metropathia hæmorrhagica" almost as a discovery. Functional hæmorrhage due to endocrine disorder without gross genital abnormality is, however, no novelty. M. Béclère suggests its treatment by the production of an artificial menopause with radium or X rays as if this were an innovation, though it has been an established procedure for years; he scarcely mentions administration of hormones for this condition, except to note that it may be attempted, and that his efforts in this direction have rarely been successful.

His book is for the most part an exposition of the uses and technique of "hysterosalpingography"—i.e., X ray of the uterus and tubes after the injection of lipiodol. The method is extolled for its utility, simplicity, and acceptability to the patient. No anæsthetic is needed, but the examination must take place in a fully equipped X ray room, so that the patient can be both filmed and screened. A special syringe and nozzle with attached manometer and volsellum forceps are required. The instrument is inserted with the patient in the lithotomy position, with the aid of a speculum, after thorough cleansing of the cervix, and it is recommended that the following twenty-four hours be spent in bed, although a few hours' recumbency suffices. Lipiodol has been used in England for investigation of the patency of the tubes in sterility cases; its use for picturing the uterine cavity with "filling defects" like a barium meal is an extension of the method not generally used here. As a routine examination it is hardly likely to find favour, since little can be discovered that will not be revealed by examination under anæsthesia with diagnostic curetting, a simple procedure that requires no elaborate apparatus, although it does imply a short anæsthetic and a few days in bed.

Another fallacious impression given by M. Béclère is that hysterectomy has been almost a routine treatment for any abnormal hæmorrhage occurring between the ages of 40 and 60, and that "hysterosalpingography" will enable us to distinguish between functional and anatomical disorders, to get some indication of the presence or absence of malignancy, and so avoid surgery for many cases. In our experience hysterectomy is much less common than he appears to think; the need for it can often be excluded by curettage, and if it is found to be essen-

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tial the operation can be done at the same session. This is not to say that M. Béclère's method is without interest. His careful clinical records, painstaking classification, and beautiful photographs will repay study.

The Infant

A Handbook of Modern Treatment. By ERIC PRITCHARD, M.D. Oxon., F.R.C.P. Lond., late Medical Director, The Infants Hospital. London: Edward Arnold and Co. 1938. Pp. 744. 18*s*.

IT is the sub-title of this book that gives the keynote of its contents; only sufficient is written about ætiology and pathology to explain the rationale of the treatment described, and prognosis is not discussed. Dr. Pritchard supplies a vast amount of information on the management and treatment of disease in infants and young children, most of which is very practical. An original and particularly useful suggestion is for the administration of thyroid to premature infants.

The practitioner who studies this book will receive help in many of his problems. He should realise that statements are made and views expressed which are personal ones, not accepted or taught by pædiatricians in general. For example, Dr. Pritchard holds in cœliac disease it is essential to give fats in full amounts, a view quite opposed to that usually adopted. His opinions about congenital pyloric stenosis are contrary to those generally held at the present time, and his dictum on mongolism—that "there can be no question that it is greatly improved by endocrine treatment"—reflects an unusual outlook. Dr. Pritchard's attitude to infant feeding is coloured by his belief, which lacks support, that a permanent hyperchlorhydria is liable to result if an infant is given such amounts of protein as are present in undiluted cow's milk; for this reason he advocates relatively low protein feeding. The arrangement of the book is good, and it is very well produced.

The Metabolism of the Frog's Heart

By A. J. CLARK, M. G. EGGLETON, P. EGGLETON, R. GADDIE, and C. P. STEWART, Departments of Medical Sciences, University of Edinburgh. Edinburgh and London: Oliver and Boyd. 1938. Pp. 308. 15*s*.

THE study of the metabolism of cardiac muscle is one of the most fundamental in the whole subject of tissue metabolism, and for this the heart of the cold-blooded animal has certain advantages over the hearts of mammals. So many of our opinions on tissue metabolism to-day are based on the results of chemical examination of tissue slices or pulps that it is essential to check these results, where possible, on tissues which are alive and functioning in a manner as near as possible to the normal. The isolated heart provides exceptional opportunities for such investigations, and much work has been done during the last 25 years on this material. Prof. Clark and his collaborators have given especial attention to the frog's heart, and have obtained results which are of value not only in themselves, but also as forming a body of evidence which largely corroborates that obtained from the study of the mammalian heart, and in some directions carries our knowledge further than these can be expected to do. This volume is a welcome exposition of their work in this field, and of the position which their investigations have now reached. It is very well produced, has an adequate bibliography, good figures, and an appendix of the methods used. References to the metabolism of the mammalian heart are only incidental, as the title would imply, and, like those to skeletal and plain muscle, are for purposes of comparison only. The book will be valued by those engaged on similar problems and by senior students of physiology and biochemistry.

The Alimentary Factor in Disease

Second edition. By MAX H. KUCZYNSKI, M.D., D.Sc., Pathologist to the Ministry of Public Health of Peru. The Hague: G. Naeff. 1937. Pp. 130. 3 guelders.

THIS book is not, as its title might suggest, a comprehensive review of the relation between nutrition and general disease, but an account from a pathologist working in Peru of a series of experimental observations. It deals with such problems as the disturbance of metabolism in yellow fever, the baldness produced in mice by feeding with fats, and the sex incidence of diseases connected with the wasting of vitamin B_1. The observations made seem to reflect a rather limited outlook and will be of interest chiefly to others working in the same experimental field.

British Journal of Surgery

THE hundredth number of this journal, dated April, 1938, contains the following papers:—

EVOLUTION AND DEVELOPMENT OF SURGICAL INSTRUMENTS.—By C. J. S. Thompson (R.C.S. Eng.). This, the fourth article in the series, deals with the evolution of the trepan and the operation of trepanning from prehistoric times to that of Sir Victor Horsley.

PARALYSIS OF THE BLADDER AND ASSOCIATED SEQUELÆ OF SPINAL ANÆSTHESIA (Cauda Equina Syndrome).—By Fergus R. Ferguson and Kenneth H. Watkins (Manchester). In the 14 cases described the use of heavy Duracain is blamed for the nerve injury, and the Novocain constituent is the toxic agent. Retention (succeeded by incontinence) of urine, incontinence of fæces, "saddle area" anæsthesia, and diminished ankle-jerks comprise the syndrome. Recovery is slow and may be incomplete.

CARCINOMA OF THE SMALL INTESTINE.—By Sir W. I. de C. Wheeler (London). In the case reported the growth was in the jejunum. The clinical findings include intermittent attacks of colic and vague abdominal pain, anæmia, and loss of weight and of appetite, with occult blood in the stools.

ENCEPHALOCELE ASSOCIATED WITH HYPERTELORISM AND CLEFT PALATE.—By Michael C. Oldfield (Leeds). The encephalocele protruded through a defect in the sphenoid and was seen in the palatal cleft. Operation was unsuccessful. The significance of widening of the nose and of the increased distance between the orbital fossæ is discussed with other points in diagnosis.

CHRONIC LYMPHŒDEMA.—By E. D. Telford and H. T. Simmons (Manchester). Five distinct groups are recognised, and clinical examples quoted of the congenital, post-traumatic, and spontaneous types. In the authors' experience the Kondoléon operation and sympathectomy have both given disappointing results.

DISLOCATIONS AND FRACTURE-DISLOCATIONS OF THE PELVIS.—By R. Watson-Jones (Liverpool). Single fractures of the pelvic ring, which cannot be widely separated and require treatment by simple recumbency, are contrasted with combined fractures of the pubic and sacro-iliac regions, which tend to be widely disrupted and require reduction and fixation in plaster. The value of the lateral position in reduction is demonstrated.

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PATHOLOGY OF THE SINGLE NODULE OF THE THYROID GLAND.—By A. M. Boyd (London). Eighty-eight solitary nodules have been examined. It is concluded that they were all innocent neoplasms, ranging from fœtal adenomata to adenomata having adult characters. No essential developmental difference is recognised between the tumours, but they are distinct from nodular goitre.

FIFTY-THREE CASES OF VESICAL DIVERTICULÆ.—By R. Ogier Ward (London). Clinical details are given of all the cases with particular attention to the part played by obstruction to outflow in their causation. Excision of the diverticulum is described.

OPERATION SUPPLEMENTED BY OBTURATOR IN THE TREATMENT OF CLEFT PALATE.—By R. R. Fitzgerald (Montreal). Results are assessed by perfection of speech and not of anatomical reconstruction. In nine cases with wide gap and scanty soft tissue, the method of Gillies and Fry has given improved speech in all who are old enough to be tested.

CLINICAL COURSE AND PATHOLOGY OF BURNS AND SCALDS UNDER MODERN METHODS OF TREATMENT.—By W. C. Wilson, Agnes R. MacGregor, and C. P. Stewart (Edinburgh). It is concluded that acute toxæmia in burns is an entity distinct from secondary shock and from sepsis, and that it is due to a toxin produced in the injured tissues which is absorbed and damages severely the cells of the liver. Efficient tannic acid treatment is the best preventive, combined with intravenous dextrose.

OSTEOCLASTOMA OF THE AXIS VERTEBRA.—By E. H. Allon Pask and S. L. Baker (Manchester). In the case described the body of the axis was almost completely destroyed. Death was due to multiple pyæmic lung abscesses following femoral thrombosis.

CASE OF CIRSOID ANEURYSM OF THE SCALP.—By Frank Rundle (London). Thorotrast radiograms showed a dilated tortuous superior temporal artery running through the tumour. Histologically the veins were seen to be more numerous than the arteries. Excision was successful.

EXPERIMENTAL INVESTIGATION INTO THE CAUSE OF PARALYSIS FOLLOWING SPINAL ANÆSTHESIA.—By A. D. MacDonald and K. H. Watkins (Manchester). Cats were used for the experiments. The paralysis was of the cauda equina type, and its causation was traced to the cocaine substitute in the anæsthetic injected. Paralysis lasted up to six months and passed off slowly.

NERVOUS CONTROL OF GASTRIC SECRETION: an experimental study.—By T. Stewart Heslop (R.C.S. Eng.). Cats and dogs were used. A tube was inserted through the duodenum into the stomach. It was proved that secretion of mucus and decreased acidity of the juice followed stimulation of the sympathetic part of the autonomic outflow. Increase of the gastric secretion and of its acidity followed parasympathetic stimulation.

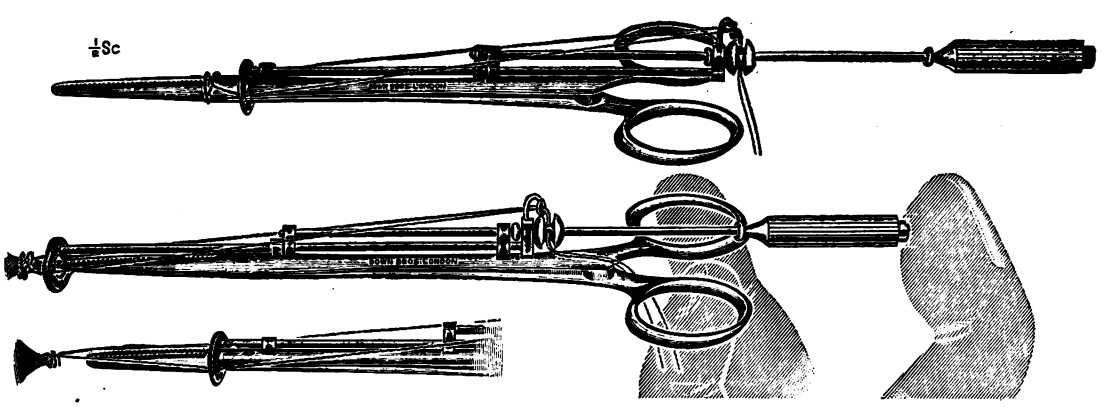
NERVOUS FACTOR IN TRAUMATIC SHOCK.—By David Slome and Laurence O'Shaughnessy (R.C.S. Eng.). It was concluded from 103 animal experiments that, provided the nervous factor is controlled, fluid loss is not fatal. Spinal anæsthesia and amputation of an injured limb both counteracted shock. The nervous factor is regarded as being of paramount importance.

NEW INVENTIONS

THE WEBB LIGATURING ATTACHMENT

NATURE having handicapped me with short fingers I have for a long time felt the urgent need for an instrument that could quickly and cleanly ligate a distant blood-vessel. I know this desire is also felt by some of my fellow practitioners. Mr. Charles H. Webb of New Zealand, in response to my suggestion and with the coöperation of Down Bros. Ltd. (London, S.E.), has designed what appears to me to be a perfect instrument for this purpose.

The instrument is time-saving, it gives good visibility at the operation site, it can be sterilised easily, it allows the use of either hand, and it enables one to tie a knot of any type. The resultant speed in tying blood-vessels has helped me to preserve a cleaner field than before, at the same time using fewer forceps within the limits of the operation area. For example, in tonsil dissection valuable time is saved because it takes only two or three seconds after picking up the blood-vessel to ligate it with any type of knot. The instrument can



To the usual pattern 7-in. Spencer Wells' forceps has been added an unobtrusive mechanism that enables the surgeon to push a loop of ligature over the tip of the forceps, and by rotating a handle, pull that loop tight with the threads in a plane at right angles to the forceps. A loop is tied over the forceps and the instrument threaded as shown in the Figure. The forceps are applied in the ordinary way and the loop can be pushed forward by the sliding mechanism; rotating the handle tightens the previously made knot. The instrument can then be withdrawn as usual and the ligature ends cut. A variety of knots can be tied and are shown on a direction paper supplied with the instrument.

then be immediately removed from the throat and the tonsil bed thoroughly examined for other bleeding points. It is useful in all cavity operations where normally it is difficult to ligate basal bleeding points. In partial thyroidectomies also the time spent in tying blood-vessels and the number of forceps employed can be considerably decreased.

The attachment has now taken its place as an absolute necessity in my equipment. Incidentally my short fingers prove to be a fine asset when using it.

RICHARD E. ISAAC, M.R.C.S. Eng.

London, N.

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THE LANCET

LONDON: SATURDAY, APRIL 30, 1938

SCIENCE AND HUMAN SOCIETY

A SUPPLEMENT to *Nature* of April 23rd discusses the formation of a society for the study of the social relations of science. The question is posed in an editorial article, advance proofs of which were sent to representative scientific workers, who were invited to express their views upon it. The forty replies make an interesting symposium. By some writers doubts are expressed whether there is any need to add to the number of scientific societies; the objects desired might be secured through existing agencies. But the weight of opinion is in favour of setting up a new body to promote the objective study of the repercussions of science upon social development. In some countries such studies have already been begun. The American Association for the Advancement of Science has resolved to make the examination of the social effects of science one of its aims. The International Council of Scientific Unions, partly at the instance of the Amsterdam Academy of Sciences, appointed last year a committee to review science and its applications as a whole and to promote the study of their social influence. Its first function is to prepare a report, with a bibliography, to be presented at the next meeting of the I.C.S.U. in 1940. The British Association, in view of the growing public interest in scientific questions, is grouping into a series those communications that bear more immediately on communal life, and has authorised the publication of a review of recent scientific progress (The March of Science, 1931–35), which is intended to be the first of a quinquennial series. The stage seems set for the new development discussed in the *Nature* symposium.

The progress of science is towards increased specialisation, and there is increasing need for some synthesising agency that shall bring scientific workers into closer touch with each other and with social workers and men of affairs. As Prof. FLUGEL puts it, what is wanted is "a consultative body to which politicians, social administrators, and industrialists will naturally turn for help and information, and to which men of science also will apply for assistance in obtaining such social facilities as they may need for their work." Various specific problems are suggested for the new society to attack. It might, for instance, collect information on such subjects as the present status of scientific research and teaching at home and abroad, the number of scientific workers, the methods of financing and coördinating research. Prof. A. V. HILL suggests that there is room for a code of ethics for scientific workers. He points out that medicine has long had standards of ethical behaviour, which have been of great value both to medical practitioners and the public; and he thinks the new society might consider questions of the "ethics of secrecy and research, of patenting discoveries of value to the public, of advertisement, of 'expert evidence,' of permitting scientific quackery, of exploiting dangerous knowledge or selling dangerous drugs . . . . of using a reputation gained by scientific work, or reflected from the main body of scientific workers, for any sectional or selfish purpose." Sir JOHN RUSSELL, writing of larger ethical problems, thinks that among the ultimate effects of scientific discoveries on modern thought is the moving away from religion as the basis of life and character. "The firm belief in a just God who would redress in a future life the pains and sorrows suffered in this life undoubtedly gave our fathers a strong feeling of courage, hopefulness, and optimism which many observers declare to be lacking to-day." Prof. PHILIP points out that advances in knowledge have not been accompanied by advances in social ethics, and that the application of the wonderful discoveries of the last fifty years has in many cases provided nothing more than what Mr. ALDOUS HUXLEY calls "improved means to unimproved ends"; and he adds that "it is time that vision and brains were devoted, not so much to an extension to the boundaries of knowledge, as to a serious and systematic examination of the problems which the discoveries of science have created." Few will dissent.

Science has transformed the conditions in which we live; the world of "Pride and Prejudice" and "Vanity Fair," though separated from us by little more than a hundred years, seems almost as remote as the Middle Ages. Science has made human life more varied with many new sources of passive enjoyment. It has freed us from pestilence and famine, deprived disease of many of its terrors, and has within a century raised the mean expectation of life at birth in this country from 41 to 61 years. It has given us the power to save life on an enormous scale. But it has also given us the power to destroy life on an enormous scale. Physics and chemistry have combined to produce efficient aircraft and efficient explosives and poison gas; and though medical practitioners in this country are no longer called upon to treat such diseases as plague, malaria, typhus fever, or scurvy, new fields of medical activity are opening up among the man-made diseases of war. Finally, science has not only placed in our hands various highly effective means for protecting and destroying human life. It has done more. It has enabled us to prevent human life. Already in nearly all the countries of western civilisation the annual number of births is below that required to replace the present numbers of the population, and contraceptive methods are becoming increasingly efficient and more generally employed. There are still those who doubt whether it is our capacity to destroy, or our capacity to prevent, human life that holds the greater menace to western civilisation. The new society will have much to think about.

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WATER BALANCE AND THE MENSTRUAL CYCLE

FLUCTUATIONS in body-weight and water balance in relation to the human menstrual cycle have been discussed more than once in these columns. A year ago we drew attention [1] to the apparent anomaly that whereas the ape tends to retain water at the time of ovulation, waterlogging in woman is most noticeable in the days immediately preceding menstruation. At that time it did not seem possible to find a common explanation for these changes, but further evidence has since appeared, and the position is now much clearer. Drs. THORN, NELSON, and THORN [2] were prompted to a study of "menstrual œdema" by their observations that various sex hormones—notably œstrogenic hormones—when injected into normal dogs caused a considerable retention of water and a parallel increase in body-weight. They accordingly set out to collect careful records of body-weight in a group of 50 normal women and in some of them were also able to make more detailed studies of the excretion of water, salts, and of sex hormones.

As regards the premenstrual phase of the cycle, the new American observations simply confirm and amplify earlier reports. A premenstrual gain in weight of 1 kg. or more was observed in 24 of the 50 women. This is accompanied by increase of water and sodium chloride and is therefore due, as previous writers had suspected, to retention of extracellular water. Of greater interest, however, is the discovery that no fewer than 38 women also showed a temporary gain in weight of 1 kg. or more in the middle period of the cycle—a gain that was also attended by retention of salt and water. This intermenstrual retention seems to be analogous with that observed in the ape, and in both species it appears to take place at or about the time of ovulation. Although the change in the ape is largely attributable to a swelling of the genitalia which is not demonstrable in the human subject, it seems probable that the same mechanism is concerned in the two species. In searching for this mechanism it is clearly desirable to look for some factor common to both menstrual and intermenstrual œdema, and since the output of œstrin is increased at both these times it is reasonable to suspect that this hormone may be in some way implicated. The proof cannot be expected however until the secretion of sex hormones can be measured more accurately than is at present possible.

Meanwhile the observation is likely to interest those concerned with another problem—namely, the suggestion that in woman sexual intercourse is fruitful only at the time of ovulation. The practical implications (for good or evil) of this belief are so far-reaching that it should clearly be either established or disproved without delay. The collection of appropriate data on a scale suitable for statistical analysis is in itself a formidable task, but a greater obstacle is the difficulty of determining exactly when ovulation occurs in a given menstrual cycle. If it can be shown that the transient intermenstrual gain in weight that is displayed by some 75 per cent. of women coincides fairly closely with ovulation, the examination of the "safe period" hypothesis might be simplified.

[1] *Lancet*, 1937, 1, 522.

[2] Thorn, G. W., Nelson, K. R., and Thorn, D. W., *Endocrinology*, 1938, 22, 155.

THE SMALL INTESTINE

AN old anatomy book remarks that the pancreas is so difficult to find as to deprive it of interest. That is hardly the case now; but certainly one of the reasons why our knowledge of the small intestine has remained meagre is that it is effectively hidden in the abdominal cavity where it is relatively insusceptible of clinical and laboratory examination. It is true that the duodenal contents may be obtained by tubage, and an estimate of the ileal contents may be made if the rate of passage through the colon is hurried. Even with special technique, however, the radiological examination of the small intestine is much less informative than that of the stomach or colon. The function of the small intestine is nevertheless of fundamental importance in nutrition; its secretions complete the disintegration and digestion of the three main classes of foodstuffs—proteins, carbohydrates, and fats—and its vast surface accounts for a remarkable absorptive capacity. That there is, as in so many important organs, a considerable reserve is shown by the fact that many feet of small intestine may be resected without apparent disability. At the same time, defective function of the small intestine may lead to much disturbance of body health generally, as shown in the sequelæ of enterogenous infantilism, cœliac disease, and sprue, while profound and catastrophic toxæmia and shock follow acute catarrhal enteritis, especially of children, and acute intestinal obstruction. In the former there is paralytic ileus from toxic paralysis of the bowel muscle; in the latter there is ileus from blocking of the passage of intestinal contents by band or pressure; in both, symptoms of intense severity result. Secretions continue to be poured into the bowel above the obstructed portion and reverse peristalsis forces the intestinal contents into the stomach, whence they are vomited. The loss of fluid leads to fall of blood chlorides and dehydration, bacterial pullulation adds to the toxæmia, and the damaged tissue may produce histamine which contributes to the shock. Great prostration results and, if the cause be unrelieved, leads to death.

In health, owing to the large surface area, absorption takes place readily even though the intestinal contents are passed along at a fairly rapid rate. The rate of passage appears to be slowed when insufficient bile enters the duodenum, owing to obstructive jaundice; peristalsis is speeded up in such conditions as Graves's disease, after pituitary extract, massage, and the ingestion of very hot or very cold food or drink. Little is known of the state of tonus of the intestinal muscle; on it may depend symptoms of dis-

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comfort—pain, wind, and flatulence—which are apt to be regarded as functional in the complaining type of patient. In others, with congestive heart failure or stasis in portal circulation, the sluggish circulation may be responsible for insufficient absorption and carrying off of gases formed in the bowel; a frequent concomitant of gas accumulation in the bowel is a lymphadenitis of the mesentery. Apart from these states of stasis, varying in degree from acute obstruction to functional slowing, the small intestine is peculiarly liable to a group of bacterial infections. On the other hand, compared with the stomach and colon it is relatively immune to cancer and the only growth of the small intestine that is at all common is the comparatively benign polypoid adenocarcinoma, which may be multiple. This difference in frequency of new growth in the small intestine, compared with the large intestine and the stomach, may be related to the stasis occurring in the latter organs, while the passage of the fluid contents of the small intestine is rapid. In spite of this rapid rate of passage, however, bacterial infections—typhoid, the paratyphoids, the food poisoning bacteria, cholera, anthrax, and tubercle—are frequent, as well as the non-specific catarrhal enteritis so common in children at certain times of the year. A chronic form of enteritis, affecting more especially the terminal ileum, has recently become defined as a disease entity. This ileitis,[1] also called Crohn's disease (he rediscovered it in 1932), has a variable symptomatology, cases simulating appendicitis, ulcerative colitis, or intestinal obstruction, or causing local abscess or fistula. The causation is at present unknown and treatment by excision offers the best result, though sometimes short-circuiting is the only possible procedure. In this disease and in other forms of infection, after peritonitis and operations, adhesions may form round the bowel, impeding its movement and function. Discomfort and more or less aching colicky pain, feelings of flatulence with or without distension, irregularity of the bowels, and alternating diarrhœa and constipation, may be complained of; these symptoms of mild chronic partial obstruction are accompanied by profound and increasing nervous phenomena, leading often to a diagnosis of neurosis.

In a clinical study[2] Sir EDMUND SPRIGGS has brought together his observations relating to another, and hitherto little recognised, condition of the small intestine—namely, diverticulosis. Diverticula of the duodenum, already found occasionally at autopsy, have been demonstrated with considerable frequency by radiology. Their symptoms if present resemble those of chronic duodenal ulcer; inflammation may occur in the wall of the diverticulum or spread to the neighbouring pancreatic tissue. Surgical interference may be required; operations for removal of the diverticulum, its invagination, or even short-circuiting the duodenum have been successful. SPRIGGS, with Mr. O. A. MARXER'S help, has now collected a series of forty-nine cases of diverticula of jejunum and ileum, many of which were multiple. The patients were of middle age, average 55 years. The commonest symptoms were flatulence, abdominal discomfort, nausea, and eructation; intermittent abdominal distension was sometimes noted. Since the symptoms appear in adult life and the diverticula have been observed on repeated X ray examination to increase in number and size, they are not regarded as congenital but as due to some weakness, probably the result of previous inflammation, of the intestinal muscle which allows of herniation through it of the intestinal mucosa. Measures directed to the lubrication of the bowel with paraffin, bowel antiseptics and carminatives, and attention to the health of the body generally, have been followed by considerable relief.

[1] See *Lancet*, Feb. 5th, 1938, p. 334.
[2] *Lpool med.-chir. J.* 1937, 45, 159.

THE BUDGET

MOST of the thoughts aroused by the new Budget would have been more usefully expressed ten, fifteen, or twenty years ago, when there were better opportunities for conciliation in Europe. Each year the Finance Bill reveals the trend of national policy, and the one described on p. 1027 is primarily devoted to foreign affairs. It would have been useless to expect the CHANCELLOR at such a juncture to make his Budget into an instrument of social reform, as some of his predecessors have been able to do, and he has probably made the best of an awkward situation. But even a rearmament Budget must have social consequences, intended or otherwise. At first sight the new taxation may be of little medical interest, but it is actually full of importance for medical men both as taxpayers and sociologists. Some attempt has been made to avert the burden of an increase in income-tax from those with the smallest taxable incomes; but this concession will be of little value to the majority of the medical profession, who will feel the full effect of the extra demands. The Budget thus further increases the difficulties of professional people who would like to have larger families but feel less and less able to give them the education and amenities they themselves enjoyed. As much as, or more than, deliberately socialist legislation it makes for a levelling of the classes; it hastens the time when the doctor's son must go to the same school as the labourer's son. This in itself may be excellent; but unfortunately rearmament does nothing to make that school worthy of either. We must look forward to days when the national expenditure will once again be directed to national rather than international objects, and for the moment get what comfort we can from Mr. EDEN'S emphasis on spiritual rearmament in his speech on Budget evening.

CONGRESS OF OBSTETRICS AND GYNÆCOLOGY.—The International Congress of Obstetrics and Gynæcology will meet at Amsterdam from May 4th to 8th. The main subjects for discussion are eclampsia, thrombosis and embolism, and hormones. The hon. secretary of the congress is Dr. F. C. van Tongeren and he may be addressed at the University Clinic of Obstetrics and Gynæcology Wilhemingasthuis, Amsterdam, W.

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ANNOTATIONS

NOT A LIFE SENTENCE

As set out in our medico-legal column recently (p. 908) a mental defective made good in the Court of Appeal his contention to have been unlawfully restrained in an institution for several years. The verdict will do something to correct the rather widely spread impression that mental deficiency is practically a life sentence. The position is really that although mental deficiency remains for life that does not mean that cases cannot and should not be discharged. It is only a comparatively small proportion of mental defectives who are liable under the Mental Deficiency Act to be placed in institutions and if in the course of time this liability no longer exists, it is possible and necessary that the case should be discharged. A considerable number of patients are discharged from time to time because the reasons for the original order no longer apply. This does not of course imply that they are no longer mentally defective. With one exception the discharge of all patients dealt with under the Mental Deficiency Act was placed by Parliament in the hands of the Board of Control. The original order is effective only for one year, at the end of which time a continuation order must be made by the Board—and so on at regular intervals. If no continuation order is made the patient is automatically discharged. Section 11 of the Mental Deficiency Act lays down the procedure by which special reports and certificates must be sent to the Board at certain specified times. They are two in number, one made by the local justices and the other by a medical man. In each case the patient must be seen and the conditions carefully considered. If the two reports agree the Board has no option but to continue the order or to discharge the patient (as the case may be), but if there is a disagreement between the two reports, one recommending discharge and the other the continuation of the order, the Board has to make the decision. Such cases receive very careful consideration by the Board which makes thorough inquiries before forming its decision, which may be for or against discharge. The exception is when patients are seen at the age of 21, when the justices have the absolute power to discharge the patient, if they so decide. Should application be made for the discharge of a patient from the order either by the patient himself or by any friend or relative, the Board gives every consideration to the request, asking for a medical report on the patient, a report on home conditions, and so forth. Actually a considerable proportion of the discharges are the result of a request either by the patient himself or his friends or relatives, made in the interval between continuation orders.

HELIUM IN ANÆSTHESIA

IT seems improbable that helium will play any large part in medical work even in America, where alone it is fairly easily procured. The most effective medical use to which it has been put in the United States appears to be for the relief of obstructed breathing during anæsthesia. Its value for this purpose lies in its extremely low specific gravity. The lightness of the gas enables it to be inhaled—and an anæsthetic vapour with it—at times when ordinary inhalation of an anæsthetic, even accompanied by oxygen, is proving difficult. Helium is entirely inert and the basis for its clinical use is to be found in its low specific gravity and rapid rate of diffusion.[1] A mixture for example of 60 per cent. helium, 25 per cent. oxygen, and 15 per cent. cyclopropane, has a specific gravity only about half that of a mixture of 85 per cent. oxygen with 15 per cent. cyclopropane. Patients suffering from stridor, whether from reflex spasm or from mechanical obstruction such as tracheal compression, have often gained speedy relief from the inhalation of helium with their anæsthetic during induction. A mixture of helium and oxygen has also been used in cases of partial respiratory paralysis during spinal anæsthesia, and it is stated that breathing became easier than when either air or pure oxygen was inhaled. Apparently, to avoid waste, the closed CO_2-absorption technique must be adopted when helium is to be employed. When obstruction is present before the beginning of induction this is started with three litres of helium to one of oxygen, with the mask closely fitted to the face. Then cyclopropane is added at the rate of 300 to 500 c.cm. per minute until anæsthesia is established.

WHY ARE TEETH SENSITIVE?

THOSE of us who have acutely sensitive patches in places where the gum has receded can hardly believe their dentist's story that the question of whether the dentine is or is not innervated has long been a subject of intensive research; that it has aroused acute and sometimes bitter controversy, and is even now in doubt. More than one patient has retorted with a yell that the evidence seems to him good enough, even as the man who kicked a stone thought that he had refuted the views of Bishop Berkeley on the non-existence of matter. Yet the problem is complex enough. The presence of nerve-fibres in the dental pulp is easily demonstrated. They accompany the blood-vessels and can be followed as far as the odontoblast layer of cells without difficulty. What if anything happens to them after that has excited much interest among histologists. The most recent contribution to the subject is that of O. W. Tiegs of Melbourne who replies[2] to some criticisms by W. Lewinsky and D. Stewart[3] of his own earlier work on the same subject.[4] A. Hopewell-Smith, a dental histologist who had devoted much study to this subject, held that the nerve-fibres ended under the odontoblast layer and that the Tomes's fibrils which proceed from the odontoblasts and pass into the dentinal tubes acted as end-organs and conveyed impulses from the dentine to the nerves. J. H. Mummery, who also spent many years on this problem, believed that he had traced the nerve-fibres into the dentine, and communicated a series of papers describing his results to the Royal Society. Later he went further and claimed to have found a layer of nerve-cells underneath the odontoblasts in which the nerve-fibres ended; from these cells, he said, axones proceeded into the dentine and could be followed for some distance. The evidence offered for this unusual arrangement was never fully accepted and this fact has tended to discredit a little unfairly his earlier work. Actually much of Mummery's pioneer work has been confirmed by Tiegs, though the latter, rather to our surprise, makes no reference to it. Using the Bielschowsky method, Tiegs has now described nerves in large numbers passing

[1] Eversole, V. H., *J. Amer. med. Ass.* March 19th, 1938, p. 878.
[2] *J. Anat.* January, 1938, p. 234.
[3] *Ibid*, 1936, 70, 349.
[4] *Ibid*, 1932, 66, 622.

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through the odontoblast layer and entering the narrow zone of tissue subjacent to the calcified dentine. Here most of them run among the Tomes's fibres as delicate and often branched fibrils and end, according to Tiegs, on the Tomes's fibres by distinct end-organs similar to the "boutons terminaux" of the central nervous system. Although he has noted the passage of a fibre through the subdentinal layer to the orifice of a dentinal tube, he has never observed a nerve passing along the tubes, and anatomically there is thus no evidence of an innervation of the peripheral part of the dentine which clinically is the most sensitive part of a tooth. Since the subdentinal layer, though apparently uncalcified, is usually regarded as a dentine matrix, later on becoming calcified, Tiegs's work might be regarded as proving the innervation of dentine, though only in an academic sense. Even now the histological problem is not entirely settled and we may anticipate further discussion on a point which seems to exercise a peculiar fascination for dental histologists, though the drawings which accompany Tiegs's paper seem to justify his conclusions. Translating histological findings into clinical terms it looks as if the acute sensitiveness of dentine must be due to a stimulation of the Tomes's fibres which transmit impulses to the nerve-fibrils and set up the pain which is caused in exposed dentine by differences of temperature and by touch and is so unpleasant an accompaniment of conservative dentistry. Why the teeth should be so richly supplied by nerves is, anyhow, difficult to explain. Tiegs suggests that it is a mechanism which serves to protect them from undue strain. He instances the momentary sharp pain felt when a piece of grit in the food suddenly concentrates the force of the bite on a tooth. One of the ways in which the wearing away of the tooth surface is compensated for is the formation of secondary dentine by the pulp which is thus protected from exposure. Possibly it is the abundant nerve-supply of the dental pulp that in some way enables this protective deposition of dentine to take place.

SERUM TRANSFUSIONS FOR SHOCK

ALTHOUGH opinion is divided on the exact mechanism of traumatic shock, there seems to be general agreement that the end-result is a dangerous lowering of the blood pressure, due to reduced blood volume. It is not to be wondered at that there should be no unanimity on the radical treatment of shock, directed to its causes; but it is certainly surprising that so many different methods should be recommended for restoring the lowered blood volume. For example, whole-blood transfusions are advised, even though there is often already an increased concentration and viscosity of the blood: hypertonic and physiological salt solutions are given, despite the fact that there is no special reduction of salts. Yet, although the reduction of blood volume is evidently due to loss of plasma, one seldom hears it suggested that plasma (or serum) should be used. It is noteworthy therefore that Bond and Wright,[1] in experiments on dogs injured in various ways, have demonstrated the superiority of serum over other transfusion fluids for this purpose. They used dried serum which was redissolved in water for use, and because of its ready solubility was termed "lyophile." When saline solutions failed to restore a gravely lowered blood pressure, transfusions of lyophile serum, either at normal strength or hypertonic, gave good results. Similar results were obtained with serum in acute hæmorrhage, and although whole-blood transfusion is clearly preferable in this condition, serum has the advantage of being immediately available and apparently of keeping indefinitely. Bond and Wright's success, and its obvious theoretical suitability, should encourage the use of lyophile serum in the treatment of shock in human beings.

[1] Bond, D. D., and Wright, D. G., *Ann. Surg.* April, 1938, p. 500.

VASODILATORS IN THE TREATMENT OF TOBACCO AMBLYOPIA

THAT tobacco may be the cause of temporary blindness was realised in Germany towards the end of the eighteenth century, and in this country tobacco amblyopia was described in 1832 by Mackenzie in his text-book "Diseases of the Eye." The precise pathology of the disorder, however, is not yet fully understood. It seems that the toxin has a selective action on certain central ganglion cells and nerve-fibres, producing a central scotoma and degenerative changes limited to the papillomacular bundle. In spite of the increased consumption of tobacco, especially in cigarettes, toxic amblyopia from this cause does not seem to be so prevalent as it was years ago. Personal idiosyncrasy and some depressing external agents such as an illness or digestive disturbance play an important part in its onset.

About 1896 Maitland Ramsay suggested that vascular spasm might be responsible for transient blindness from tobacco-poisoning, and since then Sir John Parsons and others have favoured this hypothesis. It has been pointed out that no obvious ophthalmoscopic changes can be seen in the retinal circulation in tobacco amblyopia, but some authorities suggest that the vascular spasm affects the vessels supplying part of the chiasma. Assuming spasm to be the cause, Pflimlin[1] in 1930 treated eleven patients suffering from tobacco amblyopia with injections of sodium nitrite twice weekly for 3–11 weeks. Eight of them recovered 6/12 vision or better, and five had 6/6 or better in an average of 36 days. Cordes and Harrington[2] in America have reported six cases treated by subcutaneous injection of sodium nitrite daily on alternate days, of whom five recovered 20/30 vision or better in an average of 24 days and three had 20/20 in both eyes in an average of 10 days. Duggan[3] in 1935 reported twenty-four cases which he had treated with 6–10 intravenous injections of sodium nitrite administered daily; twenty-one recovered 20/30 or better in one or both eyes in an average of 18 days and twelve had 20/20 in one or both eyes in an average of 30 days. Of twenty-two cases treated by Duggan with acetylcholine injections, sixteen showed a visual improvement to 20/30 or better in at least one eye in an average of 14 days and seven recovered 20/20 in an average of 13 days.

There is some dispute about the way in which the vasodilators act. Some authorities doubt whether vasodilatation of the retinal vessels occurs at all; others even say that vasoconstriction takes place; and some comment on the transience of the action of these drugs on the vessels of the visual pathway, which probably lasts not more than a few minutes. But whether the vascular spasm hypothesis is correct or not, and whatever the precise action of vasodilators on the vessels of the visual pathway, there seems to be substantial clinical evidence that the new remedies are useful in hastening recovery from tobacco amblyopia, for without them even mild and moderate

[1] Pflimlin, R., *Klin. Mbl. Augenheilk.* 1930, 85, 787.
[2] Cordes, F. C., and Harrington, D. O., *Arch. Ophthal., N.Y.* 1935, 13, 435.
[3] Duggan, W. F., *Ibid*, p. 1059.

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cases require at last 2–3 months' total abstinence for recovery of vision and in severe cases anything between 5 and 30 months may be necessary. Some of the patients treated with vasodilators have not even abstained from tobacco during treatment and yet have shown visual improvement. As between the two vasodilators mentioned it seems that sodium nitrite is slower than acetylcholine in effecting visual recovery, but it gives a greater degree of recovery. Its higher efficiency is probably due to its being destroyed, inactivated, and excreted less rapidly than acetylcholine.

THE DIABETOGENIC SUBSTANCE OF THE ANTERIOR PITUITARY GLAND

THE work of Houssay [1] and others during the last few years has shown that administration of suitable anterior-pituitary extracts to normal animals may lead to the temporary appearance of a condition resembling diabetes mellitus. More recently Young [2] has been able to induce a permanently diabetic condition in dogs by the daily injection of a crude anterior-lobe extract for a short time. It is perhaps unfortunate that the active principle concerned is sometimes called the "diabetogenic (or diabetogenous) *hormone*." A hormone is liberated into the blood stream to fulfil a physiological function, and the function of the active factor in the pituitary extract is obviously not the induction of diabetes. Seeking for a substance resembling the pituitary diabetogenic factor in urine, Houssay and Biasotti [3] tested the action of extracts of the urine of normal and of diabetic human subjects on the blood-sugar level of the hypophysectomised-depancreatised toad. They found that 25 per cent. of the extracts from normal urine and 70 per cent. of those from diabetic urine induced a significant rise in the blood-sugar level of the operated toads within 24 hours. The urines of 5 hypophysectomised dogs yielded active extracts, although the urines from three others did not. Figures similar to these were obtained for the urines of normal unoperated dogs, and Houssay and Biasotti could draw no definite conclusion about the physiological significance of the urinary substance. Many workers have found that various types of urinary extracts will cause a rise of blood-sugar within an hour or so of injection into a normal rabbit. Davis, Hinsey, and Markee [4] believe that the hyperglycæmic factor in urine may be a substance of the type of uric or hippuric acids, but others have inclined to the view that the urinary factor is identical with the pituitary diabetogenic substance. Bjering [5] has lately put forward this view again. He has found that subcutaneous injection into rabbits of a concentrated extract of the urine from normal, diabetic, and pregnant human beings may cause a substantial hyperglycæmia within three or four hours of injection. In general the extracts from the urine of diabetic and pregnant patients were more effective than those from the urine of normal subjects. Bjering admits that "neither the works at present available nor his own investigations prove with any certainty that this principle is the diabetogenous hormone of the anterior pituitary lobe," but he says that he believes this to be the case, for which reason he calls his urinary hyperglycæmic factor "the diabetogenous hormone."

It should be emphasised that a peculiarity of the diabetogenic action of anterior-lobe extracts on normal animals is the slowness of response to the daily administration of an active preparation. Hyperglycæmia and glycosuria seldom appear until the third or fourth day of the daily injections, and the injections of extract on the first and second days have little or no immediate action of the blood-sugar level (Houssay,[1] Young [6]). Houssay distinguishes between an immediate hyperglycæmic action of anterior-pituitary extracts and a true diabetogenic action exhibited only after some days of daily administration of extract to a normal animal; it is perhaps a pity that many workers should ignore this distinction. We believe that when a urinary substance, whose injection causes an immediate rise of blood-sugar, is described as similar to (if not identical with) the diabetogenic substance of the anterior pituitary lobe the description is not in agreement with the facts. If a urinary substance is shown either to increase the blood-sugar of a hypophysectomised-depancreatised animal, or to cause hyperglycæmia, &c., in a normal animal after three or four daily injections, then the question whether or not the substance is identical with the diabetogenic factor of the anterior pituitary gland can justifiably be discussed. Even then, in view of the positive results of Houssay and Biasotti with urine from hypophysectomised animals, the pituitary origin of the urinary factor seems doubtful.

If it can be demonstrated that the urine from diabetic or pregnant patients yields a substance with an immediate hyperglycæmic action significantly more often than does the urine of normal subjects, then an interesting fact will have been established. The value of such a fact will be obscured rather than enhanced by unjustified attempts to implicate the pituitary gland.

CEREBRAL LESIONS OF HYPERINSULINISM

THE toxic effects of insulin upon the central nervous system have become far more important now that patients are being given large doses of insulin for long periods in the treatment of schizophrenia. Between 1928 and 1933 the brains of a few diabetic patients who had died in hypoglycæmia were examined but the histological changes found could not be attributed to the effect of insulin alone, since it was acting on an already diseased brain; Elias and Goldstein, moreover, had shown that patients suffering from organic cerebral disease are supersensitive to the action of insulin. There have also been reports of what was found in the brains of two non-diabetic patients who died of hyperinsulinism. Generally in these cases there were widespread changes in the cerebral neurones, with liquefaction, vacuolisation, and homogenisation of the ganglion cells; subarachnoid and cerebral hæmorrhages were found in the diabetics. Experiments were also performed on dogs and rabbits, but the results were conflicting, M. H. Schmid in particular obtaining no evidence of irreversible changes. Such changes were supposed by many to occur in the insulin treatment of schizophrenia, some saying that they are a small price to pay for the benefits of the treatment—an opinion hardly to be adopted while the extent of the benefits and of the cerebral changes are both uncertain. Weil, Liebert, and Heilbrunn [7] have lately carried out further animal experiments in which they imitated as closely as possible the clinical procedure in the

[1] Summarised in *New Engl. J. Med.* 1936, **214**, 971.
[2] Young, F. G., *Lancet*, 1937, **2**, 372; *J. Physiol.* 1938, **92**, 15P.
[3] Houssay, B. A., and Biasotti, A., *C.R. Soc. Biol. Paris*, 1933, **113**, 469.
[4] Davis, B. L., Hinsey, J. C., and Markee, J. E., *Endocrinology*, 1934, **18**, 382.
[5] Bjering, T., *Acta med. scand.* 1938, **94**, 483.
[6] Young, F. G., *Biochem. J.* 1938, **32**, 513 and 524.
[7] Weil, A., Liebert, E., Heilbrunn, G., *Arch. Neurol. Psychiat., Chicago*, March, 1938, p. 467.

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treatment of schizophrenia. Of their fifteen rabbits six died suddenly during a convulsion, three of them having had a long period of injections (46–57 days). These three showed ischæmic disease of the ganglion cells, vacuolisation, and homogenisation, whereas in other rabbits, killed more than two months after a similar amount of treatment, shrinkage of the cytoplasm and nuclei were the striking features. In both groups there was diminution in the number of neurones in various cortical areas. The investigators suggest that the lesions they observed, which are much like those reported in diabetic and other human beings who have died of hyperinsulinism, may have been due to the "intracellular anoxemia" known to develop in the cortical cells during hypoglycæmic shock in human beings as well as in animals. Noteworthy also in the investigation was the lack of any relationship between the number of seizures and the histopathological changes, the severity of the latter being proportionate to the number and amount of the single injections of insulin, irrespective of the convulsions produced. Weil and his colleagues therefore suggest the propriety of giving smaller doses of insulin to schizophrenic patients, to avoid the cerebral damage, and of making these doses produce the desired coma and convulsions by simultaneous injections of saline solutions or serum. The bearing of this on the Cardiazol method of treatment cannot be assessed until similar careful studies of the cerebral effects of that drug are available.

THE HICKMAN MEDAL

THIS year the Hickman medal has been awarded to Dr. I. W. Magill, senior anæsthetist to the Westminster Hospital. The medal is awarded every three years, for work on anæsthesia or directly connected with it, by the council of the Royal Society of Medicine on the recommendation of the council of the section of anæsthetics. Henry Hill Hickman, who died in 1829 at the early age of 29, is fully entitled to be regarded as a pioneer of anæsthesia, for he devoted his short professional life to experimenting on the abolition of pain by inhalation. He failed to enlist the support or sympathy of contemporary men of science or of medicine in England and France—with the notable exception of Larrey—and his name was unknown in the annals of anæsthetics until Mr. C. J. S. Thompson recalled it in 1912. The institution of a medal was due to the energy of a president of the section, Dr. Cecil Hughes.

TETANUS CONVEYED BY A CANCER REMEDY

IN the town of Orlando, Florida, there have been eleven deaths from tetanus following injections of a preparation known as ℞ or Rex. A local practitioner gave injections to thirteen patients on March 25th; some reported soreness of the arm next day, and on the 27th many became ill. By the 28th all were seriously ill with symptoms of tetanus and by the 31st seven had died. Three guinea-pigs that were injected with ℞ from the same batch also died, apparently of tetanus. This preparation is said [1] to be a variant of Ensol, for which optimistic claims were made two or three years ago [2] by its originator Dr. H. C. Connell of Kingston, Ontario. Ensol is prepared by inoculating human cancer tissue in tubes containing saline with a culture of *Bacillus histolyticus*. The tissue is digested by the enzymes secreted by this bacillus and after 4–6 days' incubation the contents of the tubes are filtered through a Berkefeld candle; the resulting fluid (ensol) is injected intravenously or intramuscularly into cancer patients with the idea that the enzymes which it contains are specifically destructive to cancer cells. There seems to be little doubt that one batch of ℞ sent out by the biochemical research foundation of the Franklin Institute of Philadelphia contained tetanus toxin, possibly because it was allowed to stand from Friday to Monday before being sterilised. It is an additional source of regret that these deaths should have been caused in using a preparation whose efficacy has never been proved.

[1] *J. Amer. med. Ass.* April 9th, 1938, p. 1183.
[2] *Lancet*, 1935, 2, 898.

ENGLISH PSYCHIATRY THROUGH AMERICAN EYES

IT is illuminating for us to learn how various branches of English medicine strike the foreigner. It does not always follow that we amend ourselves after his censure or preen ourselves upon his eulogy; but when we have read his impressions we may show a little less of the insular complacency we are often credited with, and of the partisan standpoint that familiarity breeds in all but the most olympian. Partisan views are more common, perhaps, in the psychological branch of medicine than in any other; but insular complacency, on the other hand, is almost morbidly lacking in it. There is therefore much to interest us in an external appraisal of what we are doing in this field, particularly when it comes from the United States, the country to which English psychiatrists have in so many ways become indebted. Prof. Madison Bentley, whose acquaintance with the modern issues in this field is sufficiently attested by the book [1] he produced for the National Research Council in 1934, has recently written a brief review [2] of "the problems of mental disability in England" as he saw them during a visit last year. Abstaining from praise and blame he gives a dispassionate account of what he found in research, teaching, and general organisation; and compares these with related activities and trends in the United States. Though cautiously worded, his opinions about the present situation and the soundest lines of development emerge clearly enough from his paper. After a survey which most English psychiatrists will find informative and with which none could seriously quarrel, he points out how much is to be hoped from free interchange of researches between the fundamental sciences and psychiatry. He adds that this cannot be limited to the "biological subjects" in the narrower sense, but must cover a clearer and fuller factual description of psychological, social, and biographical factors. "Much more research here is necessary if students of the (mental) disorders are to exchange fanciful and speculative belief and doctrine for scientific principle and sound explanation."

The Commonwealth Fund has been the fairy godmother of the mental hygiene of childhood. In the annual report [3] of the Fund for 1937, after a discussion of what has happened during the last ten years in the child guidance clinics of the United States—where the most conspicuous changes have been in the direction of greater flexibility of organisation and procedure and closer relationship with medical schools, hospitals, and social agencies—the recent growth of these clinics in Great Britain

[1] Bentley, M., and Cowdry, E. V., The Problem of Mental Disorder, London, 1934. See *Lancet*, 1935, 1, 1220.
[2] Bentley, *Amer. J. Psychol.* January, 1938, p. 1.
[3] The Commonwealth Fund. Nineteenth Annual Report of the General Director for the year ending Sept. 30th, 1937. New York. 1938.

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is reviewed. The development from eighteen clinics in 1935 to forty-six in 1937 is attributed partly to the "years of careful and conservative work by the London Child Guidance Clinic as a centre for the demonstration of methods and the training of workers, the Child Guidance Council as a centre for public education, and the London School of Economics as a centre for the teaching of psychiatric social work." The report adds that the word "conservative" is used advisedly. It goes on to speak appreciatively of the painstaking help given by consultative bodies who guide organisation policy, and remarks how, thanks to the "British habit of voluntary service" the staff and work of the London Child Guidance Clinic was maintained at a high level in spite of necessary reductions in the salaried full-time staff. A new departure in preventive work, mentioned in connexion with the Child Guidance Council, is the arrangement whereby psychiatrists will attend two of the infant welfare centres in London during this year. The report also refers to the mental health course which it supports at the London School of Economics; hereby not only English and Scottish psychiatric social workers, but also some from Holland, Scandinavia, and even further afield receive their training. There is much else in the report, dealing with the widespread work of the Fund in the United States, which has a bearing on the development of mental hygiene and of medical education generally in Great Britain and in the Dominions and Colonies.

SURGICAL TREATMENT OF OVARIAN DYSFUNCTION

THE disorders of our bodies can be roughly classified as structural or functional: the former are usually delivered over to the surgeon and the latter to the physician. Of late years medicine has begun to claim ovarian diseases that were previously considered surgical, and with increasing knowledge of endocrine pathology it will doubtless claim many more. It is not surprising, however, that prolonged dysfunction should sometimes cause structural changes that would be irreversible even were function to be restored, and it is suggested that benefit may occasionally be got from excision of an ovarian cortex that has become abnormal. K. V. Bailey has described before the North of England Obstetrical and Gynæcological Society[1] an operation consisting in wedge-excision of part of the ovary with extroversion of the two parts remaining so that normal rupture of follicles can take place. In the cases he quoted there was failure of ovarian function, associated with abdominal pain, and he regards the presence of pain as the deciding factor in choosing this form of treatment, which he admits is a last resort. The condition of the affected ovaries he reports as cirrhosis of the tunica with fibrosis of the stroma, and he holds that the increase in cortical fibrous tissue prevents proper ripening and rupture of the follicles, thus causing both pain and further loss of function. The fibrosis found is not of chronic inflammatory origin, and Bailey thinks it attributable to basic pituitary deficiency. Naturally the pituitary is not affected directly by the operation, but there might possibly be an indirect benefit from breaking a vicious circle in which one disorder tends to increase another. Reycraft of Cleveland, Ohio, has performed a similar operation in five cases,[2] and like Bailey is careful to point out its limitations. The emphasis in Bailey's papers is chiefly on the restoration of function, by facilitating the approach of follicles to the surface, whereas Reycraft has more to say about the relief of pain: a cirrhotic cortex, he says, by hindering the rupture of follicles may give rise to so much tension and pain that many of these patients lose their nervous balance. Prof. Daniel Dougal of Manchester, who was present when Reycraft's paper was read before the American Association of Obstetricians, Gynecologists, and Abdominal Surgeons, expressed uncertainty whether the ovarian cortex is really thickened and was inclined to think that the improved functional activity seen after operation is merely a consequence of trauma. Nor do the reported comments of members of the Association suggest immediate enthusiasm for the method.

[1] Bailey, K. V., *J. Obstet. Gynæc.* 1937, **44**, 637; see *Lancet*, 1936, **1**, 315; 1937, **2**, 82.
[2] Reycraft, J. L., *Amer. J. Obstet. Gynec.* March, 1938, p. 505.

EPIDEMIC DISEASES IN CHINA

OUR correspondence columns this week contain an appeal for the kind of help for China that many of our readers may feel themselves able to offer. The situation in that country is appalling, and is made even worse by the renewed prospect of epidemics. Because of the war and the resultant migration of masses of refugees, the difficulties this year are likely to be greater than ever before, and we are informed that there has already been a small outbreak of cholera in the Changteh district of Southern Hunan where the disease does not ordinarily appear until May. The Chinese National Health Administration, in conjunction with the League of Nations, is making elaborate plans to cope with the risks of the immediate future. The thirteen epidemiologists appointed by the League have established posts in the southern, central, and north-western provinces, and to work in conjunction with these central posts a hundred mobile anti-epidemic units are being trained. Each is to consist of one doctor and two trained nurses, and they are to carry out an intensive health campaign. Advice will be given to local organisations about water-supply, the disposal of sewage, and the control of flies, and in dangerous areas an attempt will be made to inoculate the entire civilian population against small-pox, cholera, and typhoid. Already banners and posters are displayed in some parts of the country urging such simple measures as the boiling of drinking water. The supply of vaccines and sera for operations on so large a scale is no mean problem; the Central Government laboratories in Changsha, Hunan, are working to their utmost capacity and a new "serum factory" is being established in Kunming, Yunnan.

A REVISED lay-out for first-aid posts has been prepared by the Home Office, which renders obsolete arrangements made on the basis of A.R.P. Memorandum No. 1, 2nd ed. The chief differences, as set out in an official circular issued to local authorities on April 26th, are the reduction of floor space and the elimination of one of the three sections into which the portion allotted to each sex was to be divided. Each post is now to consist of a first-aid section for the wounded and gassed, whether or not contaminated on skin or clothing by blister gas, and a cleansing station for contaminated but unwounded persons. The reasons given for the changed plan are economy of staff and equipment, as well as substantial reduction in the last-minute adaptation likely to be required.

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SPECIAL ARTICLES

NUTRITIONAL ANÆMIA

A SURVEY OF DEBILITATED CHILDREN

BY ANNE E. SOMERFORD, M.D. Manch., D.P.H.
PATHOLOGIST TO THE ROYAL MANCHESTER CHILDREN'S HOSPITAL AND THE MANCHESTER HOSPITAL FOR SKIN DISEASES

THE present article embodies the results of blood-count examinations on debilitated and probably anæmic children attending the out-patient department of the Royal Manchester Children's Hospital during a period of nine months. In all 179 children were examined and 100 were found to be anæmic.

TECHNIQUE AND STANDARDS

In each case I carried out a full blood count, including a differential leucocyte count on the child and, where the child was anæmic, on the mother also. For the purpose of this paper only the results of the red-cell count and hæmoglobin will be studied. The Haldane method was used for the determination of hæmoglobin.

Red-cell counts of four millions or less per cubic millimetre, and under 70 per cent. of hæmoglobin were considered anæmic. In each case the anæmia was of the secondary, hypochromic type.

NON-ANÆMIC CASES

I have previously pointed out that while the 100 cases of anæmia were being collected 79 children were examined who, though they were debilitated, were not anæmic. Of these children 25 had counts of between 4½ and 5 millions, and 54 had counts of over 5 million red cells. An analysis shows that there were 37 girls and 42 boys, and their ages were as follows :—

Age.	M.	F.	Total.	Age.	M.	F.	Total.
Under 1	1	1	2	7	5	3	8
1	2	2	4	8	5	2	7
2	0	1	1	9	7	4	11
3	1	0	1	10	5	6	11
4	1	5	6	11	6	1	7
5	2	5	7	12	4	3	7
6	3	1	4	13	1	2	3

M. and F. = male and female.

This shows that a debilitated child is not necessarily anæmic.

ANÆMIC CASES

Age and sex.—Of the 100 cases of anæmia 36 were girls and 64 boys, and their ages varied from 2 mths. to 13 yrs. 9 mths. The total number and sex in each age-group were as follows :—

Age.	M.	F.	Total.	Age.	M.	F.	Total.
Under 1	18	3	21	7	6	3	9
1	12	6	18	8	4	3	7
2	3	5	8	9	1	2	3
3	5	1	6	10	2	2	4
4	5	0	5	11	1	1	2
5	3	2	5	12	3	1	4
6	5	1	6	13	1	1	2

It will be noticed that anæmia among these children is much commoner (69 cases) in the first seven years of life than in the second seven years (31 cases). Also, although the numbers are small to be of much value, in the first seven years of life there were 51 males and 18 females (a proportion of 3 to 1), and in the second seven years there were 18 males and 13 females, showing an incidence of 3 males to 2 females.

Financial status.—It was very difficult to assess the true financial status of the families as the conditions under which they lived depended far more on the energy, initiative, and knowledge of purchasing powers of the mothers than on the actual income received. After careful consideration it was decided to divide families into three categories as follows :—

Class A.—Families who were badly off. These included families where the father was out of work or had died, and where the total wages were 40*s.* a week or less. There were 26 of these families and in 19 the father was unemployed.

Class B.—Families who were comparatively well off. Families in this category had an income of 50*s.* or more weekly where there was one child, with an increase of 5*s.* weekly for each additional child. There were 42 families fulfilling these conditions.

Class C.—Families of moderate means. All families whose income lay between the limits of Classes A and B were included in this division, and there were 32 families in this class.

Variations in the severity of anæmia according to the income of the family are given in Table I :—

TABLE I—SEVERITY OF ANÆMIA ACCORDING TO INCOME
(Group A = poor; B = well off; C = intermediate)

Group.	—	1–2 million.	2–3 million.	3–4 million.	Over 4 million.
A	Child ..	1 (4%)	7 (25%)	18 (71%)	0
	Mother ..	1 (4%)	1 (4%)	9 (34%)	15 (58%)
B	Child ..	3 (7%)	8 (20%)	31 (73%)	0
	Mother ..	0	1 (2½%)	22 (54½%)	19 (43%)
C	Child ..	0	6 (19%)	26 (81%)	0
	Mother ..	0	1 (3%)	10 (31%)	21 (66%)

It will be seen that 45 mothers (45 per cent.) were also suffering from some degree of anæmia. Unfortunately the numbers investigated in each class are small, but little relative difference in the percentage of anæmic mothers and children is apparent in the three classes.

TABLE II—RED-CELL COUNT IN CHILDREN AND MOTHERS

Child.	Mother.			
R.B.C. in millions.		Number.	Anæmic.	Normal.
1–2	1–2	0	0	5
	2–3	0	..	..
	3–4	0	..	..
	Over 4	5	..	..
2–3	1–2	1	7	10
	2–3	1	..	..
	3–4	5	..	..
	Over 4	10	..	..
3–4	1–2	0	38	40
	2–3	2	..	..
	3–4	36	..	..
	Over 4	40	..	..

Degree of anæmia.—On the whole the degree of anæmia was not severe, only 5 children having red-cell counts of under two million red cells. There were 16 with between two and three million and 79 with between three and four million red cells. A comparison of the severity of anæmia of the mothers and children is summarised in Table II.

Two points arise from a consideration of this Table. First, although there are only 5 in number, the most

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anæmic children are not the offspring of anæmic mothers. Secondly, it is surprising that such a large percentage (45 per cent.) of the mothers are anæmic. A comparison of hæmoglobin values in mother and child was made and is shown in Table III, where

TABLE III—HÆMOGLOBIN IN CHILD AND MOTHER

Child.		Mother.								
Hb. %.	Number.	Hæmoglobin in each group.							Anæmic.	Normal.
		10	20	30	40	50	60	70		
10–20	1	0	0	0	0	0	0	1	0	1
20–30	4	0	0	0	0	1	2	1	3	1
30–40	22	0	0	0	2	4	7	9	13	9
40–50	14	0	1	1	0	2	4	6	8	6
50–60	26	0	0	0	2	3	5	16	10	16
60–70	33	0	0	1	1	0	13	18	15	18

70 per cent. on the Haldane scale represents the lowest limit of normality, and each sub-group a span of 10 per cent. on that scale. This shows that on the hæmoglobin standard there are 49 anæmic and 51 non-anæmic mothers as compared with 45 anæmic and 55 normal ones when the anæmia was based on the red-cell count.

Residential district.—The Royal Manchester Children's Hospital like many of the large northern hospitals serves a considerable area outside Manchester, hence although 78 of the anæmic children were living in Manchester or its suburbs, 22 came from nearby townships. As such a small number came from each of these outlying towns, I do not propose to analyse these cases except to point out that 2 of them lived on new housing estates. Manchester is divided into numbered postal districts, and I have assigned the children to these areas and to the suburbs.

There were 1, 1, and 2 children respectively in postal areas numbered 1, 2, and 3. These areas are situated in the centre of the city, and are largely occupied by business premises and shops; they are residential to only a small extent. Areas 5, 6, and 12—the worst areas, with 15, 14, and 8 children—are notoriously poor and congested districts, the first-named being in the region of the Ship Canal docks. There were only 3, 2, and 1 cases of anæmia in areas 7, 10, and 16, which are rather better-class and less crowded zones, and only 2 cases in number 8 which has a large Jewish population. In districts numbered 9, 11, and 15 where in the past there was much overcrowding 3, 6, and 4 cases occurred, but much has been done to alleviate overcrowding here by extensive slum clearance schemes carried out by the Manchester Corporation. There were 11 children in the suburbs of Manchester.

It is of interest to note that 18 children, including the 2 from outside the city which have already been mentioned, lived on one or other of the new housing estates, though I have no data as to the length of their residence there.

CONCLUSION

1. I think it may be stated that nutritional anæmia is much less common than a cursory glance round a children's out-patient department would lead one to suppose. Probably only about 60 per cent. of the debilitated children would prove to be anæmic.

2. I feel also that a hæmoglobin estimation is not sufficient in an investigation of this kind, and that the red-cell count is of equal value and should be included.

3. A rather surprising finding is that nutritional anæmia is by no means confined to the very poor, and in the small number that I have examined, children who were rather better off were affected to a greater extent than the poorer ones. This seems to indicate that money is either being diverted from food to clothes—for some of the better-off were very smartly dressed—or that it is being unwisely laid out in some other way. It must also be remembered that the very poor are often able to supplement nutrition from sources not at the disposal of the better-off; for example, during infancy free milk can be obtained from welfare centres and when the child reaches school age milk during school hours and a substantial mid-day meal are provided for the necessitous.

4. It is probable that among the wealthier families there is a greater use of patent foods and dried milks in preference to breast-feeding, but this is only surmise and must be the subject of later investigation.

5. The fact that 18 of the children came from new housing estates suggests expenditure on higher rents, better clothes, gardens, bus and tram fares for the wage earner, with a resultant economy in food. Thus possibly the benefit of better housing and purer air is offset by a diminution in food values. On the other hand one mother stated that her boy only became anæmic after the family had been forced to return to town in order to be nearer the father's workplace.

6. The part that overcrowding plays in the production of nutritional anæmia is hard to assess, for although overcrowded areas contained the greatest number of affected children in my series, it is very probable that the total number of children in these areas exceeds the number in a less crowded district, and also that the total number of attendances of children from these areas is large owing to the proximity of their homes to the hospital.

In conclusion, I should like to take this opportunity of thanking Dr. J. F. Wilkinson for his help and criticism, and the honorary physicians of the Royal Manchester Children's Hospital for their coöperation.

PARIS

(FROM OUR OWN CORRESPONDENT)

THE FALLING BIRTH-RATE

DISQUIETING statistics continue to be published in the press with regard to the decline, absolute and relative, in the population of France. In 1650 the population of France was 20 per cent. of that of the whole of Europe. A century later the proportion had declined to 18 per cent. In 1850 it was further down to 13·3 per cent., and in 1900 it was 9·7 per cent. At the present time the population of France represents only 8·2 per cent. of Europe's total population of 510 million. In a recent statement by the Minister of Public Health, it was pointed out that of the 1467 million francs of the public health budget, as much as 380 million is devoted to the national encouragement of large families, and this sum is brought up to 452 million, or about one-third of the total public health budget, if consideration is taken of all the credits earmarked for the natality

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campaign. An impressive sum even in these days of successive devaluations; but judging by the latest vital statistics finance is only one aspect of this perplexing problem.

INCIDENCE OF CANCER IN PARIS

Monsieur Marcel Moine, the prolific statistician, reports a study of the behaviour of cancer in Paris since 1901. Taking the two five-year periods 1901–05 and 1930–34, he shows that the frequency of cancer in Paris has apparently risen in the interval by 21·1 per cent. The annual average was 109 per 100,000 inhabitants in the first period, and 132 in the second period. The figures for 1935 and 1936 show the same rising tendency. But if due account is taken of the shifting of the age-distribution of the population in favour of the higher ages, the above figures lose much of their sinister import, for between 1901 and 1931 (census years) the number of persons between the ages of forty and fifty-nine per 1000 inhabitants has risen from 241 to 280, and for persons over sixty, from 80 to 102. And when the same age-groups are compared, it would even seem that between the ages of twenty and fifty-nine there has been a fall instead of a rise in the cancer rate. It is only after the age of sixty that the cancer rate has risen between 1901 and 1934—a rise of 15·5 per cent. With regard to the seat of the disease, the digestive tract and peritoneal cavity head the list in frequency for women as well as for men, the latter showing a comparatively high cancer rate for the mouth and respiratory tract. The cutaneous forms of cancer are almost equally distributed between the sexes and, when the necessary corrections have been made, the male cancer rate is 9·1 per cent. higher than the female cancer rate at all ages though, if account is taken only of the ages thirty to forty-nine, the female cancer rate is the higher of the two.

THE OVERWORKED SCHOLAR

The important place given to the overworked scholar in the Hygiene Congress in Paris last autumn might be taken as a hopeful sign of the times were it not for a historical survey of this subject by Dr. Clément Launay who shows in the *Mouvement Sanitaire* (No. 166) that the unequal contest between the doctor and the schoolmaster is a very old one and has hitherto ended in favour of the latter and his passion for the scholastic endowment of his pupils at all costs. Rabelais was an unsuccessful pioneer in this field, and Montaigne and Rousseau also put their hands to this plough without cutting very deep. In 1886 and 1887 the French Academy of Medicine devoted half a score of meetings to the same subject, and the resolutions it adopted on behalf of the overworked scholar were treated as pious wishes to be denied all executive expression. Since then protests by the medical profession have not ceased, and in 1929 the Comité National de l'Enfance conducted a full-dress inquiry under the direction of Prof. Nobécourt. In the same year the Academy of Medicine appointed a commission to investigate the matter, and its report formed the basis of resolutions voted by the Academy. They recommended more time to scholars for games and physical exercises at the expense of the educational curriculum. Since 1929 medical opinion has stiffened still further in favour of a healthier scholastic routine, but whenever the doctor and schoolmaster have met over this difficulty, they have done so to disagree. As long as the latter thinks only in terms of examinations and marks, it looks as if he will continue to have his own way.

AUSTRALASIA

(FROM OUR OWN CORRESPONDENT)

MEDICAL RESEARCH

THE Medical Research Endowment Act, passed by the Commonwealth Government last July, provides an annual endowment for medical research in Australia, and as a first contribution the sum of £30,000 was placed on the estimates for 1937. At its last meeting the National Health and Medical Research Council approved of assistance to university departments, to independent institutes, and to about ten young research workers. It also made possible the initiation of research into puerperal morbidity, streptococci, poliomyelitis, rheumatism, and tuberculosis. Dealing with maternal morbidity and mortality, the Council recommended that in every State there should be a mobile blood transfusion unit, a group of consultants who would be available immediately on call, an efficient antenatal system, and a consultative committee who would investigate every maternal death within practicable range of the metropolis. It is proposed that the Commonwealth Government should make payment of maternity allowance conditional upon the production of a certificate to show that medical advice has been sought at least three months before delivery, and the Council urged that hospital accommodation be increased so that it shall never be necessary to discharge any woman before the eleventh day after childbirth.

CONTROL OF BIOLOGICAL PRODUCTS

Standards laid down by the League of Nations form the basis of legislation embodied in the Therapeutic Substances Act, 1937, introduced by the Commonwealth Government. A therapeutic substance is defined as one which is "wholly or in part derived from microscopic organisms, or from living cellular tissues, or from glands removed from animals after slaughter," and no control is exercised over such more strictly chemical substances as the arsenobenzols, digitalis, and strophanthus.

Previous to this legislation the definition of therapeutic units was not uniform in Australia. Three States recognised the units adopted by the Hygienic Laboratory of Washington, U.S.A., and two States had not adopted any standard. The Act now standardises the definition of therapeutic units throughout Australia. The Commonwealth Serum Laboratories have been recognised as the Australian depôt for the international prototypes, and is the only Australian source of therapeutic sera. Sera of other sources are imported but have to contend against high tariffs. The Commonwealth Serum Laboratories have served very well the demands of such products in Australia and New Zealand.

INTERNATIONAL AIR SERVICES

In August, 1937, the flight of Mrs. Earhart Putman, before its tragic ending, linked Australia and New Guinea directly with the yellow fever areas of tropical Africa. In December, 1937, an even more significant event was the meeting in Auckland harbour of the Imperial Airways *Centaurus* and the Pan-American Airways *Samoa Clipper*. These flying boats were pioneering the new services which will shortly touch five continents within the fortnight from Southampton to San Francisco. These services will definitely end that isolation, in time and space, which formerly protected Australia, New Zealand, and the Pacific

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Islands against the importation of disease from overseas. It is reported that the new New Zealand-United States service will provide for a fortnightly carriage of mails, express freight and passengers, taking three and a half days to reach San Francisco, and four days to New York. The close watch maintained on conditions along air routes makes it unlikely, however, that even the most rapid advance of air traffic will outstrip the precautions that are being taken to safeguard the public health of countries en route.

IRELAND

(FROM OUR OWN CORRESPONDENT)

THE PUBLIC HEALTH

THE annual report of the Department for Local Government and Public Health for the year ended March 31st, 1937, has appeared months earlier than it was expected.

Reference is made to several regulations bearing on the administration of the Milk and Dairies Act, 1935, which were made by the Minister during the year. It is stated that the Act and the regulations provide a comprehensive code for securing effective control of the milk-supply intended for human consumption. The duty of ensuring the purity and cleanliness of the milk-supply is imposed on the local sanitary authorities, and this local administration, though unavoidable, is the weak point, for up to the present the local authorities, with few exceptions, have shown little interest in sanitary progress.

The gradual decline in the incidence of infectious diseases recorded in previous reports did not continue during the year; the increase was due to an extensive but mild epidemic of scarlet fever, and despite the increase in incidence there was a satisfactory decrease in mortality. The number of deaths from infectious disease during the year was 1601, being less by 303 than in the previous year, and 551 below the average for the five years 1931–35. There was a considerable fall in the incidence of both typhoid and diphtheria; in the case of the former the decline is believed to be due to improved sanitation, and in the case of the latter to the campaign of immunisation which has been most effective in the urban areas. The decline in these diseases may be regarded, it is stated, as an index of the good work of the county medical officers of health. The deaths from tuberculosis were less by 290 than in the previous year. They represented a mortality-rate of 1·17 per 1000 of the population.

The problem of maternal mortality is a cause of grave concern, and no substantial reduction in the death-rate from pregnancy and childbearing has taken place in recent years. Notwithstanding the attention the subject has received there has been a gradual rise in the number of deaths from puerperal sepsis and from other accidents of pregnancy and childbirth during the past six years. In 1931 the rate was 4·30 per 1000 births, and in the successive years since it has been 4·55, 4·44, 4·68, 4·67, and 4·70. Sepsis is the chief among these causes of death. Infant mortality is also discouraging, reaching a rate of 74·15 per 1000 births in the year under review, which is the highest since 1926.

The figures given under the head of "medical charities" show that during the year the dispensary medical officers attended 848,132 cases, of which 167,299 were attended at their homes. There are 652 dispensary medical officers. During the year some improvement in the scale of salaries of dispensary medical officers was made in nine areas, the maximum scale approved by the Department being £250–£350 a year. The conditions of granting short leave of absence on urgent private affairs to dispensary medical officers were made more easy. Six officers took advantage of the regulations which permit leave of absence for purposes of study.

BUCHAREST

(FROM OUR OWN CORRESPONDENT)

A REVIEW OF FOREIGN MEDICAL DIPLOMAS

No person may practise medicine in Rumania without the authorisation of "libera practica" accorded by the Ministry of Labour, Public Health, and Social Welfare, without an announcement in the official gazette *Monitprul Official*, and the inscription of his name in a list kept by the College of Physicians. Free practice of medicine is allowed on the recommendation of the administrative commission on the basis of the following certificates: (*a*) diploma delivered or recognised by a faculty of medicine in Rumania, (*b*) certificate of Rumanian citizenship. Physicians holding medical diplomas obtained abroad and who desire to practise in Rumania are required to have their diplomas recognised through a procedure called "nostrification." This consists of two parts, (1) equivalisation, and (2) nostrification proper, and may be accomplished at any one of the three State universities in Bucharest, Jassy, and Cluj. A number of foreign candidates have been rejected by reason of insufficient or unsatisfactory documents and a certain bogus lawyer is now known to have offered his help to some of them. He had a workshop for forging false certificates of matriculation and other documents. His help was especially requisitioned by candidates who had studied at universities, where the course of studies takes only five years (as for instance in Bologna, Italy), because at the Rumanian faculty a six-year medical course is required. In such cases the gap could only be bridged by a forged document. Although it is known that only a few people availed themselves of the help of this impostor, the authorities have deemed it advisable to subject to review all diplomas obtained by means of nostrification since the enlargement of Rumania in 1919. The National Medical Association, seeing that the matter has been widely ventilated in the lay press, has supported this review in order to restore the trust of the public in medical men and to maintain professional prestige. The Minister went even further and has ordered that *all* diplomas obtained abroad are to be produced for inspection. In consequence of this order diplomas obtained, for instance, in Vienna University as long as 30 and even 40 years ago, have to be brought up. The inspection is to be carried out by a committee appointed by the Ministry of Health and consists of a judge, who is a member of the Bucharest court of appeal, as president, two physicians, one pharmacist, and one lawyer. The committee will verify and pronounce on all the documents on grounds of which medical and pharmaceutical "libera practica" was granted, and is empowered to withdraw the concession if the applicant's certificates do not justify his right to practise in Rumania. Doctors who acquired their diplomas before 1918 had to send in their original diplomas and a certified duplicate. If the diploma is not in Latin or in German an officially

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recognised translation has to be annexed, and a citizenship paper. Doctors who obtained their diplomas between Jan. 1st, 1919, and Dec. 31st, 1937, had to send in the following documents: birth certificate, citizenship paper, a certificate of good conduct, matriculation certificate, medical diploma, a certificate received on equivalisation, and a copy of the official gazette in which right to practise was announced. The number of physicians whose diplomas will be inspected is about 3000.

ENDEMIC AND SPORADIC GOITRE IN RUMANIA

At a recent meeting of the Rumanian Medical Academy Prof. Danielopolu read a paper on observations made by eight physicians, including himself, and three veterinary surgeons in some regions where endemic goitre is prevalent: Sibiu, Strojinet, Bucovina, Tarnava Mare, the valley of Moldovita, and Alba. The number of cases observed amounted to about 40,000. Prof. Danielopolu drew the following conclusions: (1) Economical factors have a predisposing rôle in the incidence of this form of goitre which is brought about by an unknown determinating factor. (2) Endemic goitre does not spread unless nutrition, both qualitative and quantitative, is insufficient. In the regions studied it developed often at puberty and during pregnancy. Women appeared to be more affected than men, possibly from physiological causes and also because since they travel less they are uninterruptedly exposed to the influence of the noxious factor. In the cases observed by Danielopolu and his companions usually the right lobe of the thyroid gland was affected. The Ministry of Health contemplates the distribution of free drugs amongst the victims of endemic goitre and proposes to take measures to combat this scourge.

THE OWNERSHIP OF PHARMACIES

Up to the present there have been two kinds of pharmacies in Rumania: those licensed under a personal right and those licensed under conditions requiring the proprietor, if he is not a qualified pharmacist, to employ one, who is responsible for all that happens in the shop. The proprietor of a pharmacy licensed under personal right must be qualified and is allowed to sell his pharmacy only to another man in the profession. A newly issued enactment provides that in future all pharmacies shall actually be owned by the qualified men who run them. The reason for the introduction of this measure is the abuse of the privilege of leasing out of both types of pharmacy. Some shrewd pharmacists with capital have bought up several shops and hired them to qualified, but young, inexperienced pharmacists, and it is held that this action is to the detriment of the public.

TECHNICAL COMMITTEES APPOINTED BY THE MINISTRY OF HEALTH

The government some time ago empowered the Ministry of Health to appoint technical committees to study current public health problems and to make proposals in regard to the most urgent matters needing attention. Altogether 19 committees have been appointed to study the following, among other, problems: typhus fever; the campaign against malaria; eugenics; maternity and child welfare; insurance against tuberculosis; cancer; venereal diseases; rheumatism in various forms; malnutrition and deficiency diseases; the hygiene of dentistry with especial attention to the function of dental technicians. Committees are also being appointed to stimulate the campaign against alcoholism and trachoma, to promote the standardisation of biological products, and finally to investigate means of fostering international relations in health matters.

THE DEATH OF PROF. NANU MUSCEL

Dr. Nanu Muscel, professor of internal medicine at the University of Bucharest, who was for many years vice-president of the Medical Academy, died recently in his seventy-sixth year. He qualified in Paris in 1888, came back to private practice in Rumania, and then on the death of Prof. Kalindary two years later was appointed director of the Internal Clinic at the Coltea Hospital. Muscel was an old-style physician of charitable type, who sympathised with the sufferings of his patients and helped them financially when required. His private research work was concerned with pleurisy, neoplasms, and tuberculosis. Six months ago he deposited 800,000 lei at the Rumanian Medical Academy, the interest on the sum to be used for an annual prize for the best treatise of the year on the treatment of schizophrenia.

PANEL AND CONTRACT PRACTICE

A Double Complaint

THE wife of an insured person made a complaint against a chemist and as questions also arose between a doctor and the chemist the matter was referred by the pharmaceutical service subcommittee to the joint services subcommittee for investigation. The insured person was taken ill on Jan. 6th, when his panel doctor visited him and issued a prescription, saying that the patient should have three tablets that night and two on subsequent nights. The prescription was taken to the chemist at about 12.15 P.M. and the messenger was told to collect the tablets at 6 P.M., when the chemist said that one tablet only was to be taken, but gave no reason for this instruction. The tablets were therefore administered in accordance with the instructions given by the doctor. On Jan. 10th and again on Jan. 15th further prescriptions were taken to the chemist, and on each occasion medicine and a box containing ten tablets were handed to the complainant by a lady assistant, who made no comment with regard to dosage. The complainant was able to produce only one box, which bore no instructions and was said to have contained the tablets supplied on Jan. 15th, but she said that neither of the other boxes bore any instructions as to dosage.

The doctor said he was called to the patient between 9.30 and 10 A.M. on Jan. 6th, the patient having had a stroke earlier that morning. He ordered medicine and twenty half-grain tablets of soluble phenobarbitone. He told the wife that three tablets were to be taken that night, and two on subsequent nights, and his prescription bore instructions that either two or three tablets were to be taken at night. On Jan. 10th he prescribed another twenty tablets of the same strength, directing that two were to be taken at night. On Jan. 15th he was surprised to learn that there were only three tablets left, but he ordered another twenty and learnt subsequently that only ten were supplied. He afterwards recollected that on the afternoon or evening of Jan. 6th, in the course of a busy surgery, the chemist had inquired by telephone whether in place of half-grain tablets of soluble phenobarbitone, of which he had none in stock, he could supply one-grain tablets, and he had agreed, assuming that the chemist would

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explain to the wife what had been done. The doctor pointed out that the dose of soluble phenobarbitone is given in the Extra Pharmacopœia as 1–2 grains once a day, and that his patient had received three grains on the evening of Jan. 6th and two grains each night until Jan. 20th.

The prescriptions were legibly written and bore instructions in accordance with the doctor's statement, but although he ordered two tablespoonfuls of a medicine to be taken three times a day, the directions on the bottle produced by the complainant were that one tablespoonful was to be taken when necessary. When informed of the complaint the chemist replied that being out of stock of half-grain tablets he had supplied half the number of one-grain tablets, having received the doctor's agreement to that procedure. On being notified of the hearing he gave notice of his wish to withdraw his name from the committee's list.

The committee found: (1) That on Jan. 6th tablets containing one grain were, with the consent of the doctor, dispensed in place of half-grain tablets originally ordered, but that the chemist was negligent in that he failed to label the tablets with directions as to dosage and to take reasonable steps to guard against the possibility of error. (2) That the medicine and tablets ordered on that occasion were not supplied with reasonable promptness. (3) That the tablets supplied on Jan. 10th and 15th were not dispensed in accordance with the prescriptions and that they were not labelled with directions as to dosage. (4) That the medicine ordered on Jan. 15th was not labelled in accordance with the instructions contained on the prescription. The chemist appears to have made no attempt to get a supply of the half-grain tablets, although there was a responsibility resting upon him, under his contract with the committee, to keep them in stock. The pharmaceutical service sub-committee also recommended that the chemist should be severely censured for unsatisfactory dispensing under the testing scheme, account being taken of two previous cases in which similar action had been taken. The chemist is to be given the option of undertaking not to supply drugs and appliances under the National Health Insurance Act in any part of Great Britain or Northern Ireland without the previous consent in writing of the Minister of Health. Failing this, representations will be made to the Minister that his continuance upon the list is prejudicial to the efficiency of the pharmaceutical service of the insured.

GRAINS AND SCRUPLES

Under this heading appear week by week the unfettered thoughts of doctors in various occupations. Each contributor is responsible for the section for a month; his name can be seen later in the half-yearly index

FROM A CONSULTING PHYSICIAN

V

WHAT is the origin of the popular belief in the safety and harmlessness of "herbal remedies" in spite of the fact that some of the deadliest poisons are of vegetable origin? The very name "deadly nightshade" is not reassuring; the savage poisons his arrow tips with "the hellish ourali," and a cup of hemlock silenced the wisdom of Socrates. Yet I read in a herbalist pamphlet that "the Herbs provided by benevolent Nature" help to maintain a high standard of physical health, because they are grown in the fresh air and sunshine and are therefore full of vital properties. Which should be a consoling reflection to a man in the convulsive torments of strychnine poisoning. If "benevolent Nature" placed the helpful alkaloids in plants, who put the poisonous ones there? Next we are informed that the machine age cut us off from our age-old Nature medicines. This does something less than justice to the chemists and pharmacologists who isolated the active principles from these herbs in a pure form, separated the good from the evil, and substituted precise dosage for infusions and tisanes of vague and variable strength. I fail to see why vegetable drugs are the most "natural" for animals. Surely the most natural drugs for them are those produced by their own bodies, the hormones and antitoxins. Why such products should be called filthy and herbal remedies natural is even more unintelligible to me than Bunthorne's alleged passion for "a vegetable love." It may be said that it is a survival of a belief in good magic, while witches made the "gruel thick and slab" with he evil magic of

> "Eye of newt and toe of frog
> Wool of bat and tongue of dog
> Adder's fork and blindworm's sting"

and other even less agreeable animal ingredients. It is certainly an irrational survival. How interesting it would be to have a modern version of Sir Thomas Browne's "Enquiries into Vulgar and Common Errors." For though we should be less inclined than he to regard Satan as the invisible Agent and secret promoter who plays in the dark without us, we should cordially agree that the seed of error is within ourselves. The exogenous cause has vanished from our thoughts, the endogenous cause remains. But a modern Sir Thomas certainly ought not to delete from the original version a sentence of really topical importance: "Physitians (many at least that make profession thereof) besides divers less discoverable wayes of fraud, have made believe, there is the book of fate, or the power of Aaron's brest plate, in Urins." For I am convinced that one of the "less discoverable wayes of fraud" which is becoming a positive danger at the present time is a bogus biochemistry. The herbalist is an exogenous cause of error, but this type of biochemistry is an error usually endogenous to the profession. Sheets of analytical data are showered on to the patient, the meaning of which neither he nor indeed anyone else knows. They may look impressive, but they convey an idea of scientific accuracy which is entirely illusory. Still worse is the tendency to append a report giving elaborate diagnostic and prognostic conclusions, although the writer has never seen the patient, and in some cases is not even a medical man. It throws discredit upon a useful and growing science; it is not even a new trick, as this evidence shows:—

> Falstaff: "Sirrah you giant, what says the doctor to my water?"
>
> Page: "He said, Sir, the water was a good healthy water; but for the party that owed it, he might have more diseases than he knew for."

* * *

I distrust all quasi-medical slogans, whether "herbs are Nature's remedy," "like cures like," "pain is a false claim," or "the osteopathic lesion." Incidentally they are mutually exclusive. To me they indicate

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a pathetic craving for certainty in this uncertain world. It is not without significance that such cults have increased just when science has become less dogmatic. I have been comparing Carl Snyder's "New Conceptions in Science" published in 1903 with J. W. Sullivan's "Limitations of Science" published in 1933. The cocksure materialism of the earlier work is completely lacking in the later one. The Victorian period found scientific sanction in Darwin's enunciation of the evolutionary principle for believing that its rapid progress would continue. Materialism became the fashion. It is curious that with the evaporation of this idea from scientific thought there should be in the world of affairs such a renewed belief in the fallacy of force. Violence is preferred to reason. In the early days of this century, woman, who is traditionally accredited with superior intuition, sensed that this change was coming and realised that the suffrage which had been denied to reason would be granted to violence. Sir Thomas Houston has given an interesting medical illustration of the "need for violent action when in distress." He says "the pride of personality is so strong that many patients would prefer to submit to a dozen surgical operations rather than concede that their troubles are due to a deformity of personality." Every medical man knows how difficult it is for patients to accept the idea that their ill health is due to a conflict between their own ego and the environment. Somehow or other, belief in a slogan which proclaims a panacea pleases and comforts the disgruntled ego.

The political parallel unfortunately needs no stressing; it is only too obvious. Opposing slogans are shouted on every side, and the distress aroused by recent political events produced an outcry for violent action without clear conception what form that action should take or what its consequences would be.

* * *

It is, I think, helpful to look at life in general from the special angle provided by our training, for in truth medicine can touch life at every point. Helpful not only to ourselves, but to the community if we can interpret thereby some of the symptoms of the "general malaise" so prevalent to-day. It has been truly said of a distinguished physician who recently passed away that "beneath his interest in the foibles and weakness of his fellows there lay, not a feeling of superiority or scorn, but a kindly pitying tolerance and a great humour." Indeed if our profession does not teach us tolerance and humour we have practised it in vain. The recognition of the close correlation between the psychological and physical aspects of disease has, I think, encouraged an earlier development of insight into the mental distresses which produce physical symptoms. I do not think it is likely that when I started the study of medicine a junior physician could have written such a paper as that on "The Suburban Neurosis" which appeared recently in THE LANCET[1] from the pen of Dr. Stephen Taylor. To me that paper was full of encouragement for the future of our profession. I was sorry to see that it evoked so illiberal a response the next week from a still more recent recruit to the profession who apparently thinks that neurosis will be non-existent in a class-less society and thus believes in violence as a remedy. But indeed we can see evidence of the advance of medicine in every direction, an advance which is so rapid as to leave some of us seniors rather breathless in the attempt to keep pace with it. I once heard Bishop Paget say of his father's attitude towards Listerian antisepsis that like Moses on Mount Pisgah he saw the Promised Land but knew that he could not enter therein. That was finely said; it is sometimes well to realise as life goes on that we must leave things to younger men to accomplish. We may see a new truth but be too set in our ways to ensue it. It is well to be able to say "The life to which I belong uses me, and will pass beyond me and I am content."

*** *This concludes the five articles by A Consulting Physician. Next month "Silver Doctor" will be responsible for these columns.*—ED. L.

PUBLIC HEALTH

THE NEW MILK BILL

THE Government has announced that the new Milk Bill will be introduced shortly and it is anticipated that the proposals will be before the House of Commons before Whitsuntide. While the contents of the Bill are as yet undisclosed they will presumably follow the lines of the white-paper (Cmd. 5533) issued last July. As therein indicated the proposals fall into four groups. In the first group are included certain trade matters, including the setting up of a permanent milk commission to review milk questions, but not to manage the trade, and some undefined suggestions concerning the better organisation of the distributive service. Except in so far as they may lead to cheaper milk they are not of special interest to the medical profession. Another proposal is to continue the provision of cheap milk for school-children and to extend the scheme to expectant and nursing mothers and to children under school age. The importance of cheap milk for these people needs no emphasis and probably no opposition will be made to these proposals in the Bill.

A third group of proposals is to increase the present bonuses paid for milk of accredited standard and milk from tuberculin-tested herds and milk from attested herds. The medical profession is deeply interested in the provision of more milk from herds certified free from tuberculosis, such as is provided by the last two groups, and will welcome the increased bonus which should stimulate production. As regards accredited milk this is merely clean but not safe milk, since the risks of disease transmission through such milk are very little reduced. Clean milk is very desirable but all milk should be of this standard and it is open to serious doubt whether the present bonus system is the best way to secure it. The report of the League of Nations Health Organisation committee[2] recommends that milk for *consumption* should not be graded. The best milk available should be directed to the liquid market and only this milk should be offered to the public. There should be a system of grading for the producers' milk and payment would be on a basis of quality—i.e., fat content, cleanliness, and freedom of the herd from disease. Under such a system "accredited" milk would receive its higher price, but purely as a trade adjustment, and would not be offered to the public as a type of milk which suggests that it is approved for consumption as a clean, safe milk, which certainly is not the case. It is to be regretted that the

[1] See *Lancet*, March 26th, 1938, p. 759.
[2] The Milk Problem, *Bull. Hlth Org. L.o.N.* June, 1937.

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present proposals continue the anomalous position as regards accredited milk.

The last group is the one of greatest interest to the medical profession. The essential paragraph in the white-paper reads :—

"The Government propose that, subject to certain conditions, any Local Authority shall be enabled to apply to the Minister of Health, or the Secretary of State for Scotland, for an Order making compulsory the efficient pasteurisation of milk sold by retail in its area. These conditions are that no such Order shall come into operation within two years after it is made, that milk from tuberculin-tested herds and sterilised milk shall be exempt from its scope and that milk retailed from dairies where the milk is derived from a single herd shall be exempt for three years from the date of operation of the Order."

In view of the frequent additions to the list of infectious disease cases spread from the use of raw milk most experts would like to see much stronger action taken, particularly in the direction of a measure of universal pasteurisation instead of by the troublesome way of local option. As things are such action is not likely to be realised for a number of years, but the proposal does represent a great advance on the present highly unsatisfactory conditions. It is to be hoped that the medical profession will unite not only to support this proposal but particularly to strive that there shall be no diminution in the scope of these very modest proposals either by an extension of the period (already too long for areas prepared to deal effectively with milk) or by including in the exemption other types of milk (which cannot be regarded as safe from the risk of conveying disease. Only a few weeks ago the Ministry of Health published[3] the report on the Wilton outbreak of gastro-enteritis conveyed by raw milk, and in his introduction Sir Arthur MacNalty writes: "Clean raw milk is not necessarily a safe milk. . . . The only practicable way to reduce the risk of such outbreaks to a minimum is by efficient pasteurisation or by some other suitable form of heat treatment, and this applies with still greater force in the case of bulked milk-supplies where the risk is commensurately increased." The facts are so unassailable that a wider measure of pasteurisation might be anticipated and certainly the provisions in the white-paper are the minimum which can be tolerated.

Croydon Water

On the recommendation of its special typhoid committee Croydon borough council has decided to adopt certain measures for safeguarding the water-supply from contamination in future. Persons engaged in connexion with wells, reservoirs, or mains, on work that might bring them into contact with water going into supply, will be required to give their complete medical history and undergo a blood test. If the results are positive a detailed examination will be made. No person who has suffered from typhoid, paratyphoid, or dysentery may be so engaged until proved by bacteriological investigation to be free from infection; and every six months any such persons who have been off sick must have further medical and bacteriological examinations. A workman must also report any sickness in his family. Every person working in a well or reservoir must have suitable protective clothing and wear boots exclusively kept for this work and disinfected as required. No water must be pumped into supply from any well while work is in progress there, nor must the water be returned to supply until it has been pumped to waste for a suitable period and its purity has been confirmed by analysis. If it is not possible to shut down the well during this work, precautions will be taken for the effective treatment of water going into supply. Possible sources of pollution of the gathering ground at Addington will be further considered.

Mr. W. C. Knill, late engineer and manager of the Northampton water undertaking, has been appointed to the post of full-time water engineer and in future he will be responsible for the quality of the supply.

[3] Report on an outbreak of Food Poisoning due to Salmonella type "Dublin" and conveyed by Raw Milk. *Rep. publ. Hlth med. Subj., Lond.* No. 82.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED APRIL 16TH, 1938

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 1841; diphtheria, 1056; enteric fever, 29 (25 "expected"); pneumonia (primary or influenzal), 847; puerperal fever, 160; cerebro-spinal fever, 30; acute poliomyelitis, 3; acute polio-encephalitis, 0; encephalitis lethargica, 5; dysentery, 76; ophthalmia neonatorum, 80. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on April 22nd was 5351, which included: Scarlet fever, 802; diphtheria, 1140 (carriers 50); measles, 2123; whooping-cough, 279; puerperal fever, 14 mothers (plus 8 babies); encephalitis lethargica, 282; poliomyelitis, 1. At St. Margaret's Hospital there were 24 babies (plus 11 mothers) with ophthalmia neonatorum.

Deaths.—In 126 great towns,* including London, there was no death from small-pox or enteric fever, 54 (14) from measles, 6 (0) from scarlet fever, 21 (2) from whooping-cough, 29 (2) from diphtheria, 37 (10) from diarrhœa and enteritis under two years, and 52 (4) from influenza. The figures in parentheses are those for London itself.

Birkenhead reported the only death from typhoid. Measles was fatal in 28 great towns, Manchester and West Hartlepool each having 4 deaths. Birmingham reported 3 deaths from whooping-cough. Diphtheria was fatal in 17 great towns; Liverpool reported 5 deaths, Sheffield and Wigan each 3.

The number of stillbirths notified during the week was 258 (corresponding to a rate of 42 per 1000 total births), including 51 in London.

* Owing to a change of boundary on April 1st Keighley M.B. has entered the list of great towns. Its population is not yet available.

THE LANCET 100 YEARS AGO

April 28th, 1838, *p.* 143.

From an article on the mortality and sickness of soldiers engaged in war, by T. R. Edmonds, Esq.

. . . Few people appear to be acquainted with the fact, that in a long campaign the deaths through fatigue, insufficient nourishment, and exposure to cold, are much more numerous than the deaths caused by battle. Another important fact, not generally known, is, that in a long campaign one fourth part of the army is, at most times, disabled by sickness and unfit for duty. . . . During the last 41 months of the peninsular war, the proportion of captains and subalterns killed was at the rate of 4·9 per cent. per annum. The proportion of privates killed in the same period was at the rate of 3·2 per cent. per annum. By adding one third part to these numbers for dead of wounds, we shall have the total annual mortality from battle,—6·6 per cent. for officers, and 4·2 per cent. for privates. Since the deaths of captains and subalterns, from all causes, during the same period, was 10·3 per cent. per annum, and since the deaths of privates, from all causes, was at the rate of 16·1 per cent. per annum, it follows that the annual mortality from all causes except battle was—3·7 per cent. for captains and subalterns, and 11·9 per cent. for private soldiers. . . . That an English army of 61,511 men, during a period of three years and five months, should have had 13,815 men, or 22½ per cent. constantly sick, and that no inquiry should have been instituted as to the causes of the sickness, is a serious national reproach.

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CORRESPONDENCE

HELP FOR CHINA

To the Editor of THE LANCET

SIR,—It is difficult, if not impossible, for people in this country to realise the extent and severity of the destitution and physical suffering of many thousands of the Chinese resulting from the present hostilities. Recent events in Europe, together with the remoteness of China, have also distracted attention from the catastrophe in the Far East.

During the last five months we have received the most urgent appeals for help, and have brought them to the attention of the excellent organisations that are doing everything possible to mitigate the distress in the provinces of China where suffering is greatest. The answer has invariably been the same: "Every penny that comes in is pledged in advance to support the relief schemes already in operation—we cannot consider any new commitments."

A letter dated Feb. 7th, 1938, coming from Dr. C. Y. Wu, director of the Chinese Red Cross, Hong-Kong Bureau, contains the following passage:

"We are still urgently in need of the more valuable supplies, such as surgical instruments, sera, adrenaline, calomel, coramine, ferrous carbonate 0·3 g., ferri et ammon. citrat., rubber gloves, Thomas splints, oil cloth, gauze and gauze bandages 6 in. by 5 yds., autoclaves, anæsthetic masks, kerosene burners, instrument sterilisers, rubber tourniquets and tubing, &c. Funds are also urgently needed to finance our field mobile units. Each unit consists of 5 surgeons and 15 dressers, nurses, and orderlies. We now have 35 such units operating at the various fronts and it requires a minimum of 40,000 dollars monthly to upkeep them, without counting the cost of medical and surgical equipment. 7200 dollars will support one unit for six months. I hope you can assist us in this matter."

It seems to us that this appeal should be addressed direct to the profession in this country. Here is something specific, where a small gift in money or in kind will surely be turned to account. Some may feel that whatever is collected will be no more than a drop of relief in a vast ocean of suffering. This is not the view of those who are caring for the victims of war and famine in China.

The signatories of this letter are prepared to take personal responsibility for receiving and transmitting all gifts from the medical profession to Dr. Wu in Hong-Kong, and it is our earnest hope that we shall have a great deal of work to do. The address for reception of gifts of all kinds is the China Institute, 91, Gower-street, London, W.C.1.

We are, Sir, yours faithfully,

MILLAIS CULPIN,
One-time Surgeon to Shanghai-Nanking Railway Hospital;
W. C. W. NIXON,
Late Professor of Obstetrics and Gynæcology, Hong-Kong University;
H. J. SEDDON.

April 23rd.

THE ANDROID PELVIS IN OBSTETRICS

To the Editor of THE LANCET

SIR,—We are sorry to see that in a leading article in your issue of April 9th you lend your support to a theory of variations in the female pelvis originally propounded by Caldwell and Moloy of America and accepted by some obstetricians in this country. This theory is certainly contrary to the opinion of the majority of anatomists in this country, and is certainly so far not supported by any real scientific evidence. It is not denied that some female pelves may, in some respects, bear a very close resemblance to some male pelves, but we have yet to be convinced that there is any pelvis which can be described as "a female pelvis with male characteristics" due to faulty balance of the sex hormones. The long bones of the skeleton have been subjected to the most meticulous biometrical examination, and measurements in these follow the recognised laws of frequency for each sex independently; and, bearing in mind that the coefficient of variation is greater in the case of pelvic measurements than it is in the case of the long bones, there is, in this natural variability, a quite sufficient explanation of all the varieties of shape of the female pelvis. Then, too, the form of the pelvis is determined as early as the second month of fœtal life, while the sex hormones are not present in any quantity until after puberty by which time the skeleton is sufficiently fixed to be beyond their influence. In all the literature, supporting this theory, too, we notice no reference to the subpubic angle which is by far the most pronounced sex characteristic of the pelvis.

Moreover, as a practical point, it is surely now a recognised fact that engagement of the fœtal head takes place in the transverse diameter of the pelvis, a fact which we have lately confirmed by a series of radiograms taken at the onset of labour which show transverse engagement with all varieties of shape of the brim. It seems certain, then, that the shape of the brim at any rate has very little, if any, influence on the line of presentation of the fœtus, on the line of engagement of the fœtal head, or, indeed, on the whole course of labour. This opinion is based on the radiological examination of a series of over 350 cases.

We are, Sir, yours faithfully,

CLARK NICHOLSON,
H. SANDEMAN ALLEN.

Moreton-in-Marsh District Hospital, April 23rd

THE INVENTOR OF RHEUMATISM

To the Editor of THE LANCET

SIR,—The annotation on Ballonius in your last issue seems to imply that before the publication of Dr. Ruhmann's translation of the book "De Rheumatismo" no work of the Parisian physician of the sixteenth century had been translated into a modern language. But in 1708 a number of extracts from his writings were translated into French by Dr. T. Bonet, and in 1858 Dr. Prosper Yvaren rendered, also into French, the whole of the "Epidemiorum et Ephemeridum Libri Duo." French writers on epidemiology of the nineteenth century considered this work to be of importance, especially when they were comparing the writings of Ballonius with those of Sydenham.

Ballonius was the first to describe whooping-cough as a distinct disease. It was vulgarly known in Paris in his day as *quint* or *quintane*. He was the first, so far as I know, to record a case of measles ushered in with laryngitis and a case of an infant born with the rash of measles out upon it while the mother was at the same time suffering from the disease. He also pointed out that the appearance of the rash of measles might be delayed to as late as the ninth day, an observation, however, which had probably been made by Rhazes, though Ballonius did not know that.

In the first book of the epidemics he records a case of removal of the spleen which was protruding through a wound. The patient recovered. This was the second (if not the first—there is dispute on the subject)

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successful case of removal of a spleen. At the end of the account Ballonius asks—"Is the spleen, after all, so necessary?"

Ballonius's three books of "Consilia," two books of "Epidemics" and "Liber Paradigmatum" afford most interesting reading. The medical historian will get from them a good knowledge of the diseases (medical and surgical) that were prevalent in Paris in the sixteenth century; and of the methods of treatment in vogue then. They also contain several epigrammatic sayings such as the one quoted in your annotation. For an account of the life of Ballonius and of some of his writings I may refer the reader who is unable to obtain his works to papers in the *Guy's Hospital Gazette* for April, 1934, and the *Annals of Medical History* (1935, n.s. 7, 409).

I am, Sir, yours faithfully,

E. W. GOODALL.

Hemingford Abbots, Hunts, April 24th.

AN OVERCROWDED PROFESSION?

To the Editor of THE LANCET

SIR,—As one of those mentioned in your leading article who refuses so ungraciously to hand over his living to foreign refugees I should like to reply to your assertions. Firstly the definition of an overcrowded profession is surely not one in which it is impossible to obtain work but in which it is impossible to obtain work giving adequate remuneration. This may be expressed by the difficulty which members of the profession have in affording to educate their sons to the same profession. Now in the same number of THE LANCET in which your leading article appeared the L.C.C. advertise for assistant medical officers in the mental health services at £470 per annum, less £2 9*s.* for board, lodgings, &c. These posts are not house surgeons' posts but for those "who have held a residential position in a general hospital for six months"—i.e., presumably no longer in a student position but able to regard themselves as competent—and this magnificent salary of approximately £325 per annum is to be bestowed on those who have devoted five to six years and a thousand pounds on qualifying. I personally have known men with the M.D. and the M.R.C.P. apply for such posts. Again in the same column similar advertisements appear for assistant medical officers in various L.C.C. hospitals at £250 per annum, plus board, lodgings, &c. Do you, Sir, pretend that these medical officers are in a position to educate their sons to follow their own profession without the most terrific strain? It is true that this is the lowest position but it is not until after ten to fifteen years' work that these medical officers are likely to rise to the dizzy heights of superintendent or assistant superintendent with the magnificent salaries of £900 to £1500 per annum; but obviously all those who are junior medical officers cannot hope to gain these positions.

In the case of the general practitioner, or, indeed, the consultant, the position is not much different except that it has not the stability of institutional work. The average assistant in practice receives not more than £300 to £400 per annum, and I seem to remember that you have, in the past, published statistics suggesting that the average general practitioner does not earn more than £500 to £1000 per annum, whilst the consultant, after years of working as a registrar for next to nothing, may earn twice that, if he is lucky. To talk of £4000 per annum is therefore fantastic as far as the average is concerned.

I agree entirely that the whole thing is a matter of distribution and this was the reason of my letter. I suggested and still suggest that it would be better to send the foreign refugees to the countries with large populations and few doctors, such as India, rather than admit them to overcrowded England. Can you possibly deny the correctness of this? Although it is admitted that the possibility of their earning a large income is not so great in a poor country like India, and the Hebrew has less standing in an oriental country.

Totalitarianism is becoming fashionable. Soon it seems that Spain will become Fascist and possibly Czechoslovakia, Hungary, and other countries will follow. Is the admission of the ejected medical men from these countries into England to continue? If it is, we have a poor chance of earning the incomes I have given above, since you yourself admit that many refugee medical men are earning big incomes here because of the glamour of their foreign origin.

In conclusion may I point out that I understood that the "Medical Peace Group" (of which I have been a subscriber) was to forward the growth of peace and not to encourage the import of "foreign" competition. It is with regret that I find that I can support it no more and many of my friends are feeling the same. I am, Sir, yours faithfully,

April 24th. M.D., M.R.C.P.

HEARING-AIDS FOR DEAFNESS

To the Editor of THE LANCET

SIR,—As one who has spent the whole of his working life in the manufacture and supply of hearing-aids for the deaf may I reply to Mr. Macleod Yearsley's statement that "The permanent use of an aid slowly but surely increases the deafness, because every aid acts by collecting, carrying, and magnifying sounds." It is true that it is the function of a hearing-aid to magnify sounds to overcome the hearing loss compared with normal, but it does not follow that this makes the deafness worse. Deafness is usually progressive anyway. If Mr. Yearsley is correct then the deaf person must be made more deaf by any hearing he does, for he cannot hear unless sounds are amplified, whether by raising the voice or by artificial means. In choosing a hearing-aid for any case of deafness there are two main aspects to consider: (1) the physiological degree of deafness (e.g., as shown by an audiometer), (2) the loss of mental appreciation of sound. In practice it is generally the second that is the more important.

To consider first the physiological degree, the only basis for stating that deafness is increased by use of a hearing-aid would be a test carried out on a large number of cases of deafness against an equal number of controls, one group using hearing-aids, the other not. The hearing of each person would be tested at intervals during ten or twenty years. If many varying factors could be allowed for the test would provide the desired information, but it would I fear be making a sacrifice of the controls. Take a typical case of deafness arising through middle-ear trouble in early life and developing into an average of 60 decibels of deafness in middle age. At first the deafness was in the low and middle notes only; at middle age it is greatest above 3000 cycles per second. Where has this high note deafness come from except through many years of continuous strain? Would it not have been diminished if the strain had been relieved early on through use of a suitable hearing-aid? Why does our patient ask us to speak slowly and distinctly (even when not using the instrument), except through a loss of tone and a slowing up of the hearing process which might likewise have been avoided by early use of an instrument. This loss of mental appreciation of sound can be considered by

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taking two similar cases of deafness, only one of whom has used a hearing-aid regularly. The ability to hear with a good hearing-aid is far greater in the case of the regular user. Is this not to be expected where continual practice at listening to conversation has kept the ear in an educated condition?

Now watch the progress of the person who is using an instrument for the first time after perhaps twenty or thirty years of deafness. At the commencement one has to speak slowly and clearly near to the instrument; in two or three months' time the patient hears well in general conversation; later on he ventures to the theatre and hears there for the first time since he became deaf. This is a typical case of re-education. Can it be that the hearing-aid which has re-educated the hearing can destroy it also? Take an extreme case. I supplied a valve hearing-aid eight months ago to a lady, aged 61, who had never heard speech in her life. She lip-read imperfectly and spoke with the typical voice of such a case. At first she could only distinguish between two words such as "one" and "two." She has been educated with the instrument as if she were a baby and to-day she can follow a simple conversation between two or three people. Is this not a case of creation of hearing rather than destruction?

Every day thousands of deaf-and-dumb children are being taught in schools throughout the world by means of speech amplifiers. Their progress is astonishing. They will go out into the world hearing men and women instead of being deaf and more or less dumb. The next problem is to fit them up with portable hearing-aids which will give them the same quality of reproduction as the school amplifiers which taught them. Is all this planning to be set at nought by the thought that the amplifiers which created their hearing will take it away again?

I am, Sir, yours faithfully,

A. EDWIN STEVENS, B.A. (Oxon.), B.Sc., F.Inst.P.

London, April 18th.

ENDOCRINE TREATMENT OF THE CYSTIC BREAST

To the Editor of THE LANCET

SIR,—A leading article in your issue of Feb. 5th comments on the method used by Lewis and Geschickter for the treatment of chronic mastitis, and of the early indifferent stage, common to both cystic disease and adenosis, which these workers call mastodynia or painful breast. They report success both in mastodynia and in the more advanced stage (adenosis and cystic disease) from administration of œstrogenic hormone. I did not know of their work before reading your article, but from the beginning of 1936 I have used œstrogenic hormone in mastopathies of this kind and have observed complete or partial regression in nearly all the ten patients thus treated.

I was encouraged to try this remedy by reading reports such as those of Cotte and Pallot [1] and Dahl-Iversen.[2] The attempt seemed rational because cystic disease and mastodynia are often associated with menopausal symptoms, such as scarcity and irregularity of the menstrual flow, and may be attributable to predominance of the corpus luteum hormone which (it is conjectured) remains active and is no longer controlled by œstrone. The fact that these tumour formations are pre-cancerous is no argument against an endeavour to free the breasts from abnormal stimulation. The important work of Sir Robert Muir [3] shows that the so-called carcinogenic substances—among them some hormones—do no more than influence the sensitivity of the organism to develop cancer. They provoke cancer but do not generate it; they are stimulants capable of exciting the cells, favouring in them an exaggerated vitality and proliferation; and after a long time this may end in the rebellion of the tissues, with anomalies of cellular shape and invasive character, which we call neoplastic.

Œstrone, acting as a hormonal corrective, suppresses the harmful endocrine stimuli produced by domination of the corpus luteum and is thus capable of causing regression of non-cancerous mammary tumours appearing at the menopause. Naturally it should be given in moderate doses.

I am, Sir, yours faithfully,

EDUARDO BELLO.

Lima, Peru.

*** Prof. Bello encloses a copy of the *Revista Médica Peruana* for September, 1937, including a paper by him on the subject of this letter.—ED. L.

[1] Cotte, G., and Pallot, G., *Gynéc. et Obstét.* 1936, **33**, 113.
[2] Dahl-Iversen, E., *Lyon chir.* 1935, **32**, 513.
[3] Muir, R., *Lancet*, 1936, **1**, 877.

TREATMENT OF ACTINOMYCOSIS

To the Editor of THE LANCET

SIR,—Your annotation of April 16th suggests that potassium iodide does not cure actinomycosis. However that may be, I can show two cases definitely cured by French Codex tincture of iodine (now the liquor iodi simplex B.P.).

When war broke out in 1914 a lady was left in my care aged about 40. She had a hard lump in the region of the appendix of considerable size. The diagnosis of actinomycosis had been established by operation. I put her on to French Codex tincture and in the course of about a year the lump disappeared. I last heard of her about five years ago and learnt that she still remained well.

In September, 1923, a woman aged 40 was admitted to the General Hospital, Nottingham, suffering from empyema. I was present at the operation. The surgeon remarked that the lung which he could reach with his finger was remarkably hard. Pathological examination showed actinomycotic granules in the pus and they were also present in sputum. She went out under the care of her family doctor. He treated her with the French Codex tincture and in the course of about a year she became perfectly well. I last heard of her about three years ago and she was then at work and in good health.

I have reports of two other cases, both abdominal. One was treated in 1913 with iodine and I believe cured, but I have no subsequent history. The other, admitted to hospital about 1916, had been operated on for appendicitis a year previously; there were numerous abscesses, and also small superficial abscesses which, when opened, showed actinomycotic granules and *Bacillus coli*, the two being clearly symbiotic. This patient was operated on and treated by the surgeon with B.I.P.P.; he died about two months later from bismuth poisoning, with a black line on the gums, colic, and nephritis.

I believe that for successful treatment with iodine it is necessary to give it before any serious grade of secondary infection with other organisms occurs.

I am, Sir, yours faithfully,

F. H. JACOB.

Nottingham, April 25th.

PROGESTERONE IN PRE-ECLAMPTIC TOXÆMIA

To the Editor of THE LANCET

SIR,—Judging from the brief report in your last issue (p. 947), there seems something wrong with Dr. Susan Paterson's argument. Her conclusion that eclampsia can be almost eliminated if patients with the earliest signs of pre-eclampsia are given

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progesterone is not altogether satisfactory. It is supported by a comparison of 22 cases so treated with 31 treated conservatively the year before. But no reference is made to the variation in the intensity of eclampsia in different years, due to climatic differences, reflected in the seasonal variation of the disease. Prof. Dugald Baird's results with 65 cases of pre-eclampsia treated without progesterone were as good, in his opinion, as those of cases in which the agent was administered. Moreover, he thought that if the "hormone" was to be employed, it probably would be most useful at the sixth month in cases with early rise of blood pressure, and without albuminuria.

Dr. Paterson seems to believe that the hormone of the corpus luteum, when adequate, prevents pre-eclampsia, and that when it is insufficient the disease appears. How that conception fits in with the predilection of the disease for primigravidæ, and with its being for the most part a manifestation of late pregnancy, we are not told. The conception itself is based on two premises: the first is that "the health of the placenta" depends "on the health of the corpus luteum"; the second that "toxæmia" is the "direct result of the placenta being no longer healthy." Neither of these is satisfactory. The first is untrue as it stands; for the health of the placenta depends above all on the blood flow through the placental sinuses, and unless this be adequately maintained throughout the organ, all the progesterone in the world will not prevent infarct formation, or the organ becoming unhealthy. Dr. Paterson appears to assume that the blood flow through the placental sinuses, throughout the last six months of pregnancy, proceeds completely undisturbed whatever the patient be doing, whether she be working or resting, whether her abdominal muscles be weak or strong. Such an assumption is altogether unwarranted. The second premise is not consonant with the natural history of pre-eclampsia: the absence of the disease in cases presenting an "unhealthy" placenta; its occurrence in women with an apparently healthy, normal placenta; and indeed, its appearance post partum, not only after some hours of delivery of the intact placenta, but even some days after.

There is a further implication in this argument: it is that the so-called pregnancy toxæmia (pre-eclampsia) is a state sui generis, peculiar to pregnancy. But the more we look at this, the more uncertain does it become. Your readers will remember that it was the recognition of the close resemblance of patients with puerperal convulsions—the natural ending of pre-eclampsia—with anasarcous women labouring under acute Bright's disease, which led Lever to examine the urine in the former, with his immortal discovery. Since Lever's time, much water has gone under the bridges: we know now that the blood changes in the two states are identical. But if pre-eclampsia is in fact simply acute Bright's disease occurring in pregnancy, the possibility of a pathological effect of placental change being responsible for eclampsia is for ever eliminated, and the question of aberrant endocrinal activity also becomes shelved. Ablation of the ovaries, or aberrant endocrine activity—e.g., of the pituitary—in the non-pregnant is not a cause of acute Bright's disease.

Thus do we come to fundamentals. In spite of all that has been said to the contrary—the occasional absence of albumin before fits in eclampsia, and the imputed freedom from pathological change of the kidneys in some cases, to both of which replies are not lacking—the basal condition to be considered in the genesis of acute Bright's disease, whether the patient be pregnant or not, is the state of the kidney. If obstruction to the outflow of urine from the cortex by the engorged medulla explains the oliguria of pre-eclampsia—as it does of post-partum eclampsia, or the anuria induced by suddenly emptying the over-distended bladder in cases of enlarged prostate—the oliguria of acute Bright's disease in the non-pregnant is to be similarly explained. The loops of Henle, presumably, have some significance—even at the bedside! The effect of constriction of cutaneous arterioles on the engorgement of internal parts is not simply a subject of academic interest—it matters in the street—it mattered in the trenches!—and it matters to the uninitiated primigravida, unlucky enough to be advanced in pregnancy in the spring or fall of our year.

I am, Sir, yours faithfully,

Rugby, April 24th. R. H. PARAMORE.

VENOUS THROMBOSIS AS A SIGN OF VISCERAL CANCER

To the Editor of THE LANCET

SIR,—Having followed the reports published in your issues of Feb. 19th and 26th and March 5th and 12th I would like to give a brief account of two cases I reported at the medical staff conference at the King's County Hospital in Brooklyn on March 29th last.

The first patient, a woman of 51, was operated upon in January, 1937, for a ruptured cyst of the left ovary that proved to be an adenocarcinoma; she developed signs of venous thromboses in the upper and lower extremities in January, 1938. These thromboses were followed directly by an acute pulmonary infarction involving the right lower chest. This in turn was followed by a cerebral insult manifested by a crossed right third nerve paralysis (Weber's syndrome). Then the patient developed venous obstruction in both lower extremities, a pulmonary infarction to the left lower chest, and signs of involvement of the blood-vessels of the spine as manifested by signs referable to a right lower motor neuron lesion. This in turn was followed by thrombosis of the deep veins of the right lower extremity and finally another cerebral insult at which time the patient lapsed into coma and ultimately made an exitus.

It is interesting to note that in this case pelvic examination did not reveal any evidences of recurrence of the original malignancy or other abnormal findings until about a fortnight before death. The uterus, which was normal in size and fully movable and whose surface was covered with many smooth nodules, became markedly enlarged. At no time was there any ascites or other manifestation of local or metastatic spread. The platelet count was increased to 380,000.

The second case was that of a 50-year-old female who had thrombosis of the popliteal veins manifested by swelling of the right leg, and subsequently developed a pulmonary infarct and a cerebral insult at which time she lapsed into coma and died. This woman had an enlarged nodular liver and the clinical diagnosis was carcinoma of the liver, probably secondary. X ray studies of the stomach and duodenum were normal. This patient died before a thorough examination could be made, and necropsy was not obtained.

These cases show that Trousseau's observations are not to be confined to carcinoma of the stomach but may apply to other types of visceral carcinoma.

I am, Sir, yours faithfully,

Brooklyn, N.Y., April 2nd. GEORGE LIBERMAN.

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OBITUARY

JOHN BRIGHT BANISTER, M.D.Camb., F.R.C.P.Lond., F.C.O.G.

THE widespread distress caused by the sudden death of J. Bright Banister, which occurred on a golf course on April 16th, is a measure of his forceful personality and of the range of his activities and influence. These extended far beyond the world of obstetrics, though he contributed largely to the revival of interest in the study, practice, and teaching of this subject during the last 30 years. Recently he had given an increasing amount of time to more indirect public service of various kinds and his repute was high everywhere for clear thought, persuasive speech, and that quality of good mixing that ensures the success of work done in coöperation.

Born at Blundellsands, near Liverpool, just 58 years ago, the son of Howard C. Banister, John Bright was educated at the Merchant Taylors school, Crosby, and Jesus College, Cambridge, taking the natural science tripos in 1901. He went for his clinical course to Charing Cross Hospital, qualifying L.S.A. in 1906, and after holding three resident posts at the hospital took his medical degree in 1908 and the M.D. in 1909. By this time he had already chosen his specialty, having been appointed resident medical officer to Queen Charlotte's Maternity Hospital in 1908; it is noteworthy that the subject of his M.D. thesis was premature induction of labour in cases of contracted pelvis—a subject which never lost its interest for him. He spent the next three years as pathologist and registrar to Queen Charlotte's, returning to Charing Cross as obstetric registrar and tutor, a man marked for promotion. It was not until 1924, on the retirement of Dr. T. W. Eden, that a vacancy arose, though then Bright Banister held a junior post for only two years, succeeding Dr. Cuthbert Lockyer as senior obstetric physician in 1926.

Meanwhile Bright Banister had taken every opportunity to fit himself for such responsibilities. He had taken the M.R.C.P. Lond. in 1910 and the F.R.C.S. Edin. in 1913, the year of his marriage to Jacqueline M. M. Dix; and the outbreak of war found him already well on the steps of the honorary ladder of the various other general and special hospitals to which he was to give good service on its cessation. He was already registrar, and soon to become physician, to the Chelsea Hospital for Women, physician to out-patients to Queen Charlotte's, and assistant gynæcologist to the Prince of Wales Hospital, Tottenham. He had published, jointly, a "Manual for Midwives" that was to achieve considerable success, besides some notes of unusual cases in our columns and elsewhere. He started war work as civil surgeon to a military hospital in London, but in 1915 he joined the Anglo-French Red Cross Hospital at Le Tréport and in 1917 obtained a commission in the R.A.M.C. and became surgeon-specialist to No. 17 B.G.H. in Alexandria. On demobilisation Bright Banister soon re-established himself and this was the period when he gave much of his time and energy to Queen Charlotte's. There he impressed his fellow workers, both doctors and nurses, as exceptional not only in his manipulative skill but in his judgment and clinical insight. At a time when the special voluntary hospitals were contemplating an uncertain future he showed already on committees the flair for wise constructive policy which manifested itself elsewhere in later years. His attitude to hospital patients concealed under a cheerful bearing an anxious regard for their welfare to which they unconsciously responded, and he never minded being summoned at any hour of the day or night even when no action proved to be called for. He was specially kindly and considerate to student midwives, and when he became in later life not only examiner to the Central Midwives Board but one of its members, he remembered well the difficulties of learning practical midwifery and sought to devise means of adjusting them. He was one of the team who wrote Queen Charlotte's Practice of Obstetrics, first published in 1927, contributing the section on contracted pelvis. Every year a dinner is held for past and present members of the honorary and resident staff of the hospital; over this year's gathering, held last Saturday, he was to have presided.

Bright Banister was attached not only to those hospitals already mentioned, but to many smaller ones, including the Florence Nightingale Hospital, the Northwood Memorial Hospital, the Passmore Edwards Hospital, Wood Green, and the West Norwood Maternity Home; and from everywhere one hears different aspects of the same story of an outstanding figure, in both senses (he was 6 ft. 4 in. in height), of a large-hearted man in whom were combined an unusual collection of fine qualities: rare professional competence; great dexterity; a sympathetic regard for patient and student; athletic distinction; skill in debate and in the management of men; a good business head; and an exalted sense of honour.

In later years his position at Charing Cross and as senior surgeon to the Chelsea Hospital for Women and his examinerships enabled him to influence the direction of British obstetric teaching. The influence was in the main conservative. He felt strongly the need for careful consideration before attempting to adjust misplacements of the uterus, and contributed an article on this subject to our series on Modern Technique in Treatment (Vol. II). He did not advocate or practise the lower segment Cæsarean operation. In cases of pelvic contraction he preferred induction of premature labour to the more modern method of trial labour, basing his practice on a follow-up published in 1926 of a large number of cases. He was not a prolific writer; it was in the

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lecture room and on committees that he made himself felt. His post-graduate lectures at Charing Cross on strategy and tactics in obstetrics (1931) and on uterine inertia (1932) were good expositions of what the audience of practitioners came to learn, and his address (1932) to the Medico-Legal Society advocating the appointment of medical assessors to advise judges on technical points shows the increasing preoccupation with the wider aspects of sociological medicine to which Dr. J. S. Fairbairn testifies below. Not that he gave less attention to the smaller world of the Charing Cross Hospital and medical school, of which he was appointed vice-dean in 1928, becoming vice-chairman of the medical committee in 1935 and chairman only last month. That his interest in the social life of the students was sustained is shown by the fact that he presided over the Medical Society as long ago as 1912 and over the Students' Dramatic Society in 1938. His direct approach and his immediate perception of the essentials of any subject made him a crisp and effective teacher; and candidates examined by him—whether midwives, students at the Universities of Cambridge, London, or Aberdeen, or experts sitting for a higher diploma—were at once put at their ease and enabled to do their best. He achieved honour in all three branches of medicine, being elected F.R.C.P. Lond. in 1928, F.C.O.G. in 1929, and M.M.S.A. in 1937.

We learn from his contemporaries that in his youth "J. B." was a fine oar; he rowed in his college boat the year Jesus went head of the river; and his later friends knew him as a keen golfer. He delighted in arranging such cricket matches as one between a Charing Cross eleven and the village team at Tatsfield, where he had a house. His geniality indeed pervaded alike his private and his public life, for his gifts as a speaker were unusual. No matter what the occasion, how short the notice, one of his friends tells us, he could, and consistently did, produce extempore a speech balanced in phrase, appropriate in sentiment, and polished as a gem. It is not remarkable that Bright Banister, who was an enthusiastic freemason, reached the high position of Grand Deacon in the Craft.

We leave Dr. Fairbairn to comment on the debt British medicine owes to Bright Banister and endorse his view that at his untimely death Banister's influence had by no means reached its zenith. He writes: "In adding my tribute to John Bright Banister, whose death at the height of his powers and before completing his term of hospital service will be deeply deplored by his London colleagues, I would particularly stress his public spirit. Framed on big lines, broad-minded, large-hearted, with a wide outlook and a breezy and confident manner, he exercised a steadily increasing influence on both the practice and social aspects of obstetrics and gynæcology.

"His interests, which lay more towards midwifery, are indicated by the active part he took in the preparation of the Queen Charlotte's Hospital text-book, and by his consent to act as a representative of the Society of Apothecaries on the Central Midwives Board, and to serve as the Society's permanent examiner for its diploma of mastery in midwifery. He was one of the small band of British obstetricians who attended the B.M.A. meeting in Melbourne in 1935 and contributed much to its success. After it was over he paid a visit to New Zealand where he addressed meetings in several of the larger centres to appreciative audiences. His interest in and service on the council and executive committee of the British College of Obstetricians and Gynæcologists shows another gap left by his death, and here again one with his public spirit will be sorely missed.

"Banister was ever a cheery soul and the best of good company; he was out to enjoy life and work and not to look for trouble; and thus he leaves a wide circle of friends to mourn his passing."

THOMAS KAY, D.S.O., M.B., F.R.F.P.S. Glasg.

Mr. Thomas Kay, who had been living in retirement for the last nine years at Machrihanish in Argyllshire, died on April 20th in a Glasgow nursing-home. He was the son of Mr. Thomas Kay of Helensburgh and was educated at Larchfield Academy and at the universities of Glasgow and Paris. He qualified in 1893 and became assistant to Sir William Macewen at Glasgow. He served as a civil surgeon in the South African War and was mentioned in dispatches and given the Queen's medal with five clasps. On his return from South Africa he was appointed assistant surgeon to the Glasgow Royal Infirmary and later became lecturer in clinical surgery at Glasgow University. In the late war he was A.D.M.S. to the First and Forty-sixth Divisions with the rank of colonel, was mentioned in dispatches three times, and awarded the D.S.O. and Croix de Guerre. He was honorary surgeon to the King from 1927 until his retirement in 1929 and since then has done a great deal of voluntary surgical work on the peninsula of Kintyre. He married Margaret Romanes, a daughter of Dr. J. F. Fergus of Glasgow.

WILLIAM HENRY DOLAMORE, F.R.C.S. Eng., L.D.S.

Mr. Dolamore who died on April 19th in his 74th year was one of the outstanding figures in dentistry and had played a prominent part in the development of the dental profession since the war. He was educated at the Royal Dental Hospital and St. Mary's Hospital, taking the L.D.S. in 1888 and the conjoint diploma in 1892. He was elected to the staff of both hospitals and served them faithfully for many years. He was dean of the Royal Dental Hospital throughout the difficult years of the war when students were few. When the war was over and the great influx of students began the task of enlarging the resources of the school was one which called for great administrative abilities. Both school and hospital prospered under his wise rule. He had an exceptionally clear brain and a keen sense of business; in dealing with students as well as in committees with his colleagues he could command respect and gain affection. The improvement of the academic status of dentistry was an ideal very dear to his heart, and the recognition of the Royal Dental Hospital as a school of London University was largely his doing. He was an examiner in dental surgery to the Royal College of Surgeons, serving the full period of ten years. His election to the fellowship in 1933 was a recognition of his services to dentistry which gave pleasure to generations of past students.

Dolamore was keenly interested in dental politics and was prominent in the counsels of the British Dental Association for the greater part of his professional life. Before the passing of the Dentists Act, 1921, the qualified section of the profession had many difficulties to contend with. The recognition of dentistry and the part it should play in public health was tardy. In association with such men as Sir Norman Bennett and the late Robert Lindsay he did much to raise the status of the profession and to

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bring about legislation which made registration compulsory. Much of this work called for delicate negotiation and was done behind the scenes. Comparatively few knew its extent and importance at the time and to-day fewer still realise how much their profession owes to the self-sacrificing work of Dolamore. He was elected president of the British Dental Association in 1915 and held this position for three years. When the Dental Board was formed Dolamore was elected to represent qualified dentists and did much useful work, especially on committees. Later his shrewd judgment led to his appointment as treasurer.

In his later years he was handicapped by increasing deafness and, though his judgment was as sound as ever, yet his disability made it difficult for him to carry out his many activities. When he ceased to be a member of the Dental Board his many friends while regretting the loss of his wise counsels felt he had richly earned the right to retirement. Few men indeed have served their profession with such loyalty and devotion. He was himself content with the reward of work well done and the esteem and affection of his colleagues.

A. J. DOUGLAS CAMERON, M.B. Aberd.

Dr. Cameron died in his sleep on April 18th at the International Clinic which he founded near Tunbridge Wells eight years ago. Born at Kintore in 1887 he qualified in 1909 at the neighbouring university of Aberdeen and after a short period of general practice at Gargrave, West Yorks, settled in Northampton, where his energy and acumen won for him a large practice of enthusiastic patients. One of these presented him with Preston Deanery Hall for use as a clinic which was transferred in 1931 to Sherwood Park, which he transformed into one of the best equipped institutions in the country. In the conduct of this clinic Dr. Cameron visualised the importance of team-work in the investigation and diagnosis of disease, especially chronic conditions of ill health. He collected around him men versed in the various ancillary sciences in addition to the usual group of consultants and specialists, and these he supplied lavishly with facilities for research and treatment. Much of the apparatus was constructed in a large workshop in the grounds of Sherwood Park. His design was to make the place the centre of a nexus of affiliated international clinics where new advances in medical science would be rapidly disseminated. In this aim he was supported by Dr. Gourliau of Paris, and at the time of his death he had already established affiliations in the majority of European countries.

"In consequence of an extremely busy life," writes one of his colleagues, "Dr. Cameron's literary output was meagre, but no one who met him in consultation could fail to be struck with his knowledge of recent work and his enthusiasm for his profession. To his own patients he was not only the beloved physician; he was the final arbiter in their physical difficulties. Just before his death Dr. Cameron had arranged for the complete reorganisation of the clinic, partly for personal reasons and partly because he wished to devote himself to the awakening of the national conscience to the importance of new conceptions in the training of youth. His friends are now taking steps to carry on the clinic as a memorial to his activities."

Mr. THOMAS EDWARD LESCHER, O.B.E., F.C.S., managing director of Messrs. Evans Sons Lescher and Webb, died in Liverpool on April 24th after a skating accident. He was the elder son of Mr. F. H. Lescher, one of the founders of the firm, and during the late war he was responsible, under the National Health Insurance Commission, for the control of the supply of drugs and chemicals to the public. Last year he was chairman of the British Pharmaceutical Conference.

PARLIAMENTARY INTELLIGENCE

THE BUDGET

ON April 26th the House of Commons reassembled after the Easter recess. Sir J. SIMON, Chancellor of the Exchequer, made his Budget statement. He stated that the estimated revenue for the coming year on the existing basis was £914,400,000. It was proposed to impose additional taxation amounting to £30,350,000, making a total of £944,750,000. The estimated expenditure was £944,398,000, leaving an estimated surplus of £352,000. The prospective deficit was due to increasing rearmament expenditure. The five-year programme announced in February, 1937, of £1,500,000,000 would now cost a great deal more. The Defence Loans Act, 1937, authorised the raising by loan towards this expenditure of £400,000,000, and of this sum £100,000,000 had already been raised. In the 1938 estimates the Government had allowed for borrowing £90,000,000. The decision to accelerate rearmament and increase munition production would involve supplementary defence estimates later in the year. These would be met from borrowed moneys. The peak year of defence expenditure had not yet been reached. Unless the international situation improved rapidly the cost of maintenance would remain high after the programme was completed and the drop from the peak expenditure might not be as rapid and steep as could be desired. The Government had reached the conclusion that looking at the programme as a whole some part of the increased cost must be met by additional taxation now. This would reduce difficulties hereafter and show the country's determination to face its task.

There would be in this Budget an increase of 6*d.* in the £ in the standard rate of income-tax with certain provisos. The wear-and-tear allowance would be increased by a further 10 per cent. The rate of tax on the first £135 of taxable income would be maintained at 1*s.* 8*d.* instead of being raised to one-third the new standard rate—viz., 1*s.* 10*d.* In regard to Schedule A, when a tenant paid tax at the standard rate on Jan. 1st and this exceeded the quarter's rent, he might postpone payment of excess till April 1st. The net produce of the increase in the standard rate, subject to the provisos, in 1938 would be £22,250,000 and in a full year £26,500,000. The tax on light hydrocarbon oils and heavy oils used for road transport would be increased from 8*d.* to 9*d.* per gallon, estimated to produce in 1938 £5,000,000. An oil duty of 9*d.* a gallon would be imposed on power alcohol which hitherto had been untaxed. The duty on all tea would be raised by 2*d.* a lb.

A number of alterations would be proposed in the existing law to prevent the avoidance of taxation by legal means (1) to prevent the manipulation of trusts and settlements for the avoidance of super-tax; (2) to strengthen the law relating to the taxation of income arising from assets transferred abroad. The question of tax avoidance would continue to be watched closely and fresh legislation would be introduced, if necessary, with retrospective effect if fresh devices were resorted to by taxpayers. Other amendments of the law would include the strengthening of

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the law in regard to estate duties, and the assessment of sinking fund business of insurance companies. There would be certain minor amendments of last year's National Defence Contribution legislation in relation to allowance for losses and the deduction of annual payments in the computation of profits.

Referring to the medicine stamp duty, Sir J. Simon said that a committee of the House which considered this subject, made a valuable report last year, but it had not yet been possible to arrive at conclusions on all the complex issues involved. It was his intention that a decision should be reached before next year's Finance Bill.

QUESTION TIME

TUESDAY, APRIL 26TH

London Hospitals and A.R.P.

Colonel NATHAN asked the Home Secretary what directions had been given or were contemplated, for the information of the general and special hospitals in London, as to the measures they should take for dealing with patients and as to the functions they were desired to fulfil in the event of air-raids.—Mr. GEOFFREY LLOYD, Under-Secretary, Home Office, replied: Instruction in the methods of dealing with gas casualties is being given to the medical and nursing staffs of London hospitals as part of the Home Office scheme of medical anti-gas instructions. A handbook on the structural protection that can be arranged in hospitals for the additional safety of staff and patients will shortly be issued. As regards the last part of this question this must await the completion of the survey which is being undertaken by my right hon. friend, the Minister of Health.

Colonel NATHAN: Is the hon. gentleman aware that I have in my hand a letter from the Air Raid Precautions Department of the Home Office stating that pending the completion of the survey of hospital accommodation throughout the country, it is regretted that it is not possible definitely to allocate to individual hospitals the parts they may be called upon to play? That letter is addressed to a hospital adjacent to this House. Is this in accord with the policy of the Home Office?—Mr. LLOYD: I do not know the date of the letter.—Colonel NATHAN: The 19th of April.—Mr. LLOYD: We must have a little further information, and I do not think it will be necessary for the survey to be completed all over the country before dealing with the London hospitals.

MEDICAL NEWS

University of Oxford

In convocation on April 26th it was agreed that the honorary degree of D.Sc. should be conferred upon Dr. Harvey Cushing, emeritus professor of surgery at Harvard University. He is to receive the degree on July 16th.

Mr. G. R. Girdlestone, Nuffield professor of orthopædic surgery, has been elected to a supernumerary fellowship at New College.

Prof. A. P. Dustin, of the University of Brussels, will give two lectures on May 4th and 5th at noon. In his first lecture he will speak on the caryoclasic poisons, and in his second on the effects of the arsenical compounds and colchicine on cell division.

The George Herbert Hunt travelling scholarship for 1938 has been awarded to Dr. W. E. Gibb.

University of London

At recent examinations the following candidates were successful:—

D.P.M.

With special knowledge of mental diseases.—G. L. Ashford, Hilda M. S. Davidson, John Gibson, W. S. L. Gilchrist, Augusta G. Harrison, and S. H. Lubner.

Part A.—J. E. O. Gillespie, David Gilmour, and William Telfer.

University of Glasgow

On April 23rd the following degrees were conferred:—

M.D.—J. C. Dick, T. J. Jones, and W. T. W. Paxton (with honours); Hunter Gillies and Margaret B. MacLean (with high commendation); F. E. Crawley, William Morton, and R. H. Wiseman (with commendation); W. W. Ballardie, J. A. Carson, Alice E. Dickie, Samuel Dunn, Mary G. Gorrie, J. E. Rankine, L. G. Scoular, and William Thomson.*

* In absentia.

M.B., Ch.B.—J. F. B. Wyper, John Green, Herbert Brash, and Peter McKenzie (with commendation); John Alcorn, D. J. S. Armstrong, R. B. Bell, R. A. Blair, W. K. N. Brown, D. R. G. Buchanan, Etheldreda Cadas, Charlotte B. Clark, Rhoda M. E. Clark, Claud Cohen, W. C. Colville, James Conner, R. W. Davidson, S. L. Davidson, Barbara S. Dawson, Muriel J. W. Dobbin, R. B. Dobson, J. W. N. Duerden, Constance I. Dunbar, A. M. Gardner, J. M. W. Gibson, T. A. Goodwillie, J. S. Gordon, Margaret T. Graham, A. F. Granger, John Hammerton, M. B. Hay, A. G. Hegarty, S. B. Hendry, Alice M. Insh, W. M. Jamieson, William Johnston, Margaret Lavery, I. G. Lennox, S. B. Levy, D. C. Lillie, J. C. P. Logan, J. M. MacCormack, I. S. McCormick, Duncan MacInnes, Margaret McKay, F. Y. McKendrick, J. M. McKillop, F. C. McLaren, Matthew McLearie, J. G. McMenemy, Adaline N. Miller, J. P. Monie, A. S. Morrison, C. G. Nairn, Daniel Neville, J. A. O'Connor, Hugh Paterson, J. St. C. Polson, R. S. Rankin, W. M. Robinson, Alfred Roy, R. N. Rutherfurd, Agnes L. Scott, Thomas Semple, Chang-Yui Shu, R. N. Sinclair, Marion C. Steven, J. M. Sword, Winifred J. Symington, A. L. Taylor, A. M. Thomson, D. A. Thomson, Lazarus Tobias, Matthew Urie, H. G. J. van Bavel, D. L. Waddell, J. C. Walker, John Weir, James White, M. D. Winning, and D. W. Zahn.

Bellahouston gold medals were awarded to E. D. Cooper and D. P. Cuthbertson.

Royal College of Physicians of London

The Charles Murchison scholarship in clinical medicine will be awarded this year by the college. It is of the value of 20 guineas and candidates should send their names to the registrar of the college, Pall Mall East, London, S.W.1, not later than May 31st.

Royal Faculty of Physicians and Surgeons of Glasgow

At a meeting of the faculty on April 4th, with Dr. John Henderson, the president, in the chair, Santosh Lal Robert (India) was admitted to the fellowship.

British Empire Cancer Campaign

Applications are invited from medical men for the post of medical secretary and registrar to the clinical cancer research committee of the campaign. The successful candidate will be required to visit certain clinics in the United States. Further information will be found in our advertisement columns.

British College of Obstetricians and Gynæcologists

A meeting of the council of the college was held on April 23rd, with Sir Ewen Maclean, the president, in the chair. The following were formally admitted to the fellowship:—

Kenneth Vernon Bailey (Manchester), *William Alfred Gordon Bauld (Canada), William Ewart Barnie-Adshead (Birmingham), *James Black (South Africa), Margaret Glen Bott (Nottingham), Charles Philip Brentnall (Manchester), Robson Christie Brown (London), *Rupert Iggulden Furber and *John Sydney Green (Australia), John William Alexander Hunter (Manchester), Richard Glynn Maliphant (Cardiff), *Gerald Carlton Melhado (Canada), Harold Jordan Malkin (Nottingham), *Subodh Mitra (India), *Charles Frederick Morkane (New Zealand), Arnold Learoyd Walker, Everard Williams, and Arthur Joseph Wrigley (London), and *Herman Brookfield Van Wyck (Canada).

The following were admitted to the membership:—

Y. N. Ajinkya, *Mary C. Albuquerque, J. J. Armitage, Elinor F. E. Black, Doris B. Brown, W. D. Brown, Henry Canwarden, *W. D. Cunningham, Mary Evans, M. B. Hallam, *O. S. Heyns, *R. A. Logan, J. C. Loxton, *B. E. Meek, John Miller, *E. A. Menon, *E. B. Moore, R. W. Nichol, Susanne J. Paterson, C. G. Roworth, P. W. S. Riley, *D. F. Standing, L. M. Snaith, Dorothy M. Stewart, R. K. Tampan, R. A. Tennent, *G. A. Thompson, W. H. Tod, *C. V. Ward, Alice Woodhead, and J. C. Whyte.

* In absentia.

F. G. MacGuinness and G. J. Strean were elected to the membership.

Mr. T. N. A. Jeffcoate and Mr. R. A. Brews were appointed the first Blair-Bell memorial lecturers.

At the annual general meeting which followed Mr. Aleck Bourne, Prof. A. L. Robinson, Prof. William Gough, and Prof. James Hendry were elected to the council as representatives of the fellows, and Dr. E. A. Gerrard and Dr. W. C. Armstrong as representatives of the members.

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Society of Apothecaries of London

At recent examinations the following candidates were successful:—

Surgery.—G. E. N. Bird, St. Bart's.; J. C. Gregory, Camb. and St. Bart.'s; M. W. Hemans, Oxon and St. George's; G. E. King-Turner, Guy's; F. P. S. Malone-Barrett, Westminster; F. D. P. Palmer, Middlesex; and H. A. N. Passmore, Charing Cross.

Medicine.—A. Backman, Guy's; P. Baker, Sheff.; M. Becker, Royal Colleges, Edin.; W. D. Brinton, Oxon and Guy's; N. D. Cousins and A. Dunkerley, Manch.; J. Frankenthal, Liverp.; C. C. B. Guest, Sheff.; J. S. Lancaster, Camb. and St. George's; C. L. Summersfield, Leeds; and P. A. Walshaw, Leeds and London.

Forensic Medicine.—P. Baker, Sheff.; M. Becker, Royal Colleges, Edin.; W. D. Brinton, Oxon and Guy's; N. D. Cousins and A. Dunkerley, Manch.; J. Frankenthal, Liverp.; C. C. B. Guest, Sheff.; G. E. King-Turner, Guy's; J. S. Lancaster, Camb. and St. George's; C. L. Summersfield, Leeds; and P. A. Walshaw, Leeds and London.

Midwifery.—S. K. Das and H. J. Dismorr, St. George's; T. C. Hallinan, Camb. and Charing Cross; F. H. Holder, Manch.; and R. P. Parkinson and J. A. V. Shone, London.

The following candidates, having completed the final examination, are granted the diploma of the society entitling them to practise medicine, surgery, and midwifery:—

G. E. N. Bird, W. D. Brinton, N. D. Cousins, C. C. B. Guest, T. C. Hallinan, M. W. Hemans, J. S. Lancaster, H. A. N. Passmore, and P. A. Walshaw.

Scottish Conjoint Board

At recent examinations by the board of the Royal Colleges of Physicians and of Surgeons of Edinburgh and the Royal Faculty of Physicians and Surgeons of Glasgow, the following candidates were successful:—

H. K. Abbas, Leslie Ballon, B. G. Barlow, Julius Brimberg, George Buchanan, F. G. Chung, Ruth F. Conway, John Cross, Else A. d'Amian, Desider Engel, Hildegart Fischer, W. D. Gilmour, Margot Goldschmidt, H. W. Gray, Wulf Grobin, Margaret Heller, R. L. Hill, Hermann Jacks, John Johnston, R. St. J. R. Johnston, Robert Kahane, S. J. Kopet, Isadore Kotzin, I. D. M. B. Maclurkin, Malcolm MacLean, Stephen Mayer, T. R. W. Millar, Paul Nathan, Hans Nelson, Daniel Neville, Else Paneth, Else Perls, S. L. Pollock, E. L. Rees, A. S. T. Said, C. A. Smith, H. H. Teitelbaum, Louis Toporoff, J. L. Trainer, Matthew Urie, G. C. Wainwright, and J. C. Young.

University of Aberdeen

At a meeting of the general council on April 16th the proposal to extend the medical curriculum to seventeen terms was approved in principle. The details of the draft of the new curriculum will be considered by the business committee of the council along with members of the teaching staff. The university will continue to give instruction in chemistry and physics, but there will be five academic years of study after these subjects have been passed. In the new curriculum it is proposed to rearrange the midwifery course so that the student has more time for clinical instruction.

Linacre Lecture

Sir Gowland Hopkins, O.M., F.R.S., will deliver this lecture in the lecture room of physiology at St. John's College, Cambridge, on Friday, May 6th, at 5 P.M. He will speak on biological thought and chemical thought, with a plea for unification.

University of London Medical Graduates Society

The annual dinner of this society will take place at the Langham Hotel, Portland-place, London, W., on May 10th, at 7.45 P.M., when the guest of honour will be Sir Cuthbert Wallace, president of the Royal College of Surgeons of England. Sir Charlton Briscoe, president of the society, will be in the chair. Application for tickets should be sent to the secretary of the society, 9, Hardinge-road, London, N.W.10, not later than May 7th.

Association of Surgeons in India

The organisers of the Association of Surgeons in India, Lieut.-Colonel K. G. Pandalai and Mr. C. P. V. Menon of Madras, have received encouraging support, but it has not been found practicable to hold the inaugural meeting, as was hoped, in Bombay this month, and the meeting has been postponed until Oct. 22nd. A committee of Bombay surgeons will be responsible for the local arrangements and Dr. M. D. D. Gilder, Minister for Public Health of Bombay, has agreed to preside and to deliver the inaugural address. This will be followed by discussions on ileocæcal tuberculosis and carcinoma of the tongue. The association is proposing to publish a journal of its own.

Royal Society of Tropical Medicine and Hygiene

The Manson medal has been awarded to Major-General Sir Leonard Rogers, F.R.S., and will be presented to him at the annual general meeting of the society on June 16th. The medal is awarded triennially "to the living author of such work in any branch of tropical medicine or tropical hygiene as the council may consider to be deserving of the honour."

Demonstrations of Contraceptive Technique

On Thursday, May 5th, at 2.30 P.M., a practical demonstration of the technique of the use of a variety of contraceptive methods will be given by Mrs. Marie Stopes, D.Sc., and Dr. Evelyn Fisher at the C.B.C. clinic. Medical practitioners and senior students should apply for tickets to the hon. secretary at the clinic, 108, Whitfield-street, London, W.1.

International Medical Congress for Psychotherapy

The tenth International Medical Congress for Psychotherapy will be held at Balliol College, Oxford, from July 29th to August 2nd under the presidency of Prof. C. G. Jung. The main subjects for discussion will be psychology of the phases of life; and psychotherapy and psychosomatic problems. A small exhibition is being held to cover those sides of psychotherapeutic work which can be more conveniently demonstrated in graphic form. Members of the medical profession who wish to send material should write to the hon. secretary of the congress, Dr. E. B. Strauss, 81, Harley-street, London, W.1.

The Royal Sanitary Institute

A sessional meeting of the institute will be held in the City Hall, Cardiff, on Friday, May 6th, at 5 P.M., in conjunction with the Welsh branch of the Society of Medical Officers of Health and the South Wales and Monmouthshire centre of the Sanitary Inspectors Association. Dr. D. A. Williams, deputy medical superintendent and physician at Llandough Hospital, will open a discussion on the first municipal asthma clinic, and Mr. J. A. Glover, assistant sanitary inspector for Cardiff, will speak on the place of the public health department in relation to the council housing estates.

British Empire Leprosy Association

At a meeting of this association held at the India Office in London on Tuesday last, with Lord Halifax in the chair, Major-General Sir Cuthbert Sprawson, F.R.C.P., suggested that the decline of leprosy in England in the fourteenth century was largely due to popular interest in the disease; the whole country set itself upon a leprosy campaign and attained a success surprising in view of their deficient knowledge and their lack of personal hygiene. "It is an interest of that nature," said Sir Cuthbert, "we should now try to arouse throughout the affected parts of the Empire and in the mother country." The British public could above all give money, and could send out trained and eager workers in a spirit of self-sacrifice, like those supplied by Toc H. In a leprosy campaign in the Madras Presidency he had found that the active work of the doctors was of little avail without the aid of a larger number of social workers; in the present Empire campaign the leading rôles were being filled by the workers from Toc H, but many more than those were required. In Madras even the poorest peasants were made to feel an interest, and it was necessary to foster the right kind of native public opinion in all infected countries. With leprosy, as with tuberculosis, the understanding and active coöperation of the mass of the population was essential to success.

Sir William Peel, chairman of the association, also referred to the Toc H workers who have given up their vocations at home and have gone abroad, on a bare subsistence allowance, to devote their lives to the lepers. There was a waiting-list of some 50 volunteers, but with present resources no more could be sent though they were badly needed. To train, equip, send out, and maintain a lay worker for five years cost about £1500. There were to-day at least two million lepers in the British Empire and despite all efforts very little had so far been achieved in checking this terrible scourge.

Other speakers included Sir Humphry Rolleston, Sir John Megaw, and Dr. Howard Cook.

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University of Dublin

On Wednesday, May 4th, at 5 P.M., Sir Henry Dale, F.R.S., will deliver the John Mallet Purser lecture at the School of Physic, Trinity College. He will speak on chemical agents transmitting nervous excitations.

London School of Hygiene and Tropical Medicine

A special lecture describing the anti-leprosy campaign in Brazil will be given at the school to-day, Friday, April 29th, at 5 P.M., by Dr. H. C. de Souza-Araujo, secretary of the International Centre of Leprology in Rio de Janeiro. All interested are invited to attend.

British Postgraduate Medical School

The date of Prof. J. C. Drummond's lectures at the Medical School on practical aspects of modern vitamin research was incorrectly given in our last issue. He is speaking on Wednesdays at 4.30 P.M., and his first lecture will be on May 25th.

London Homœopathic Hospital

A course of Honyman Gillespie lectures will be given at this hospital on Tuesdays, at 4 P.M., from May 10th to June 28th. Further information will be found in our advertisement columns.

Indian Medical Service

The annual dinner of the Service will be held at the Trocadero Restaurant, London, on Tuesday, June 14th, at 7.15 P.M., when Major-General E. W. C. Bradfield will preside. Tickets may be had from the hon. secretary, Major Sir Thomas Carey Evans, Hammersmith Hospital, Ducane-road, London, W.12.

British Association of Radiologists

The fourth annual general meeting of this association will be held in Belfast on May 13th and 14th when Dr. R. M. Beath will be installed as president. Prof. P. Flemming Møller (Copenhagen) will address the meeting on chronic fluorine poisoning as seen from a radiological standpoint. In the section of radio-diagnosis, papers will be read by Dr. T. Garratt Hardman, Dr. J. F. Brailsford, and Dr. Peter Kerley; and in the section of radio-therapeutics, by Dr. S. Cochrane Shanks, Dr. Ralston Paterson and Miss Margaret Tod, and Dr. Robert McWhirter. Further information may be had from the secretary, 32, Welbeck-street, London, W.1.

International Red Cross Conference

The International Red Cross conference, which was to have met in Madrid this year, will be held in London from June 20th to 24th. The opening and closing sessions will take place at St. James's Palace and other meetings will be at B.M.A. House, Tavistock-square, W.C. Among the subjects for discussion is a plan, put forward at the International Congress of Military Medicine, for the creation of neutralised hospital zones in war areas. Other subjects include the work of the Red Cross during civil war, first aid on roads throughout the world, the standardisation of bandages and other medical materials, and the future of air ambulances.

Appointments

COLE, H. A., M.B. Sheff., Assistant Medical Officer at Wadsley Mental Hospital, Sheffield.

GABB, R. T., M.B. Camb., Pathological Registrar at the Royal Northern Hospital, London.

KEANE, C. A., M.R.C.S. Eng., D.P.M., Deputy Medical Superintendent at the Mental Hospital, Berry Wood, Northampton.

MACKEITH, S. A., M.R.C.S. Eng., D.P.M., Deputy Medical Adviser to the Warwickshire Mental Deficiency Acts Committee.

SMITH, W. H. M., M.B. Edin., M.Ch.Orth. Liverp., F.R.C.S. Eng., Hon. Orthopædic Surgeon to the Doncaster Royal Infirmary.

THOMPSON, ANNA V., M.B. Belf., Assistant Medical Officer of Health for York and Resident Medical Officer at York Maternity Hospital.

WEBSTER, R. C., M.D. N.U.I., Resident Assistant Medical Officer at the Isolation Hospital, Bolton.

Certifying Surgeons under the Factory and Workshop Acts: Dr. B. HOLDEN (Macclesfield District, Chester); Dr. D. MACCOLL (Killin District, Perth); Dr. R. D. JENKINS (Almondsbury District Gloucester).

Vacancies

For further information refer to the advertisement columns

Aberdeen University.—A. W. Garden Fellowship, each £200.
Accrington, Victoria Hosp.—H.S., £175.
Ashton-under-Lyne, Lake Hosp. and Darnton House Institution.—Sen. Res. M.O., £250.
Aylesbury, Royal Buckinghamshire Hosp.—Sen. and Jun. Res. M.O.'s, at rate of £200 and £150 respectively.
Barnsley, Beckett Hosp. and Dispensary.—Cas. O., £250.
Birmingham City, Mental Hosp. Dept.—Jun. Asst. M.O., £350.
Birmingham and Midland Eye Hosp.—H.S., at rate of £130.
Bolingbroke Hosp., Wandsworth Common, S.W.—H.S. and Cas. O., each at rate of £120.
Braintree, Black Notley Sanatorium.—Jun. Asst. M.O., £250.
Brighton, Royal Alexander Hosp. for Sick Children.—H.S., £120.
Bristol City and County.—2 Asst. M.O.H's., each £500.
British Empire Cancer Campaign, 11, Grosvenor-crescent, S.W.—Med. Secretary and Registrar, £500.
Bury St. Edmunds, West Suffolk General Hosp.—H.S., £180.
Caernarvonshire County Council.—Asst. County M.O.H. and School M.O., £600.
Carmarthen, Joint Counties Mental Hosp.—Sen. Asst. M.O. and Deputy Med. Supt., £500.
Charing Cross Hosp., W.C.—Hon. Clin. Asst. to Dermatological Dept.
Chester, Barrowmore Tuberculosis Sanatorium, &c., Gt. Barrow.—Jun. Asst. M.O., at rate of £200.
Devon County Council, Hawkmoor Sanatorium, Bovey Tracey.—Res. Asst. M.O., at rate of £250.
Dorset County Hosp., Dorchester.—H.S., £150.
Dreadnought Hosp., Greenwich.—Physician for Out-patients.
Dublin City Skin and Cancer Hosp., Hume-street.—Deep X Ray and Radium Therapist, £700.
Dundee Mental Hosp., Westgreen.—Jun. Asst. M.O., £300.
Edgware, Redhill County Hosp.—Visiting Dermatologist, 3 guineas per session.
Hendon Borough Council.—Asst. M.O.H. and Asst. School M.O., £600.
Hosp. for Sick Children, Great Ormond-street, W.C.—Res. Asst. Physician, £200. Out-patient M.O., £150. Two Res. Med. Assts. and Clin. Pathologists, each £125. Asst. Res. Surg. O., £100. 2 Res. H.P.'s and 2 Res. H.S.'s, each at rate of £50.
Hosp. for Tropical Diseases, 25, Gordon-street, W.C.—Two Jun. Hon. Anæsthetists.
Hounslow Hosp.—Anæsthetist, 1 guinea per session.
Huddersfield County Borough.—Asst. M.O.H., £500.
Hull Royal Infirmary.—Second Cas. O., at rate of £150.
Kent County Council.—Consultant Obstetricians, from 2 guineas to 6 guineas.
King Edward Memorial Hosp., Ealing.—Ophth. Surgeon. Also 2 Hon. Anæsthetists.
Kingston-on-Thames, South Middlesex Fever Hosp.—Asst. Res. M.O., £250.
Leigh Infirmary, Lancs.—Sen. Res. Surg. O., at rate of £250.
Liverpool Heart Hosp.—H.P., at rate of £100.
London Chest Hosp., Victoria Park, E.—Med. Reg., £175. Surg. Reg. Also H.S., at rate of £100.
London County Council.—Asst. M.O., Grade I, £350. Also Asst. M.O.'s, Grade II, each £250.
London Jewish Hosp., Stepney Green, E.—Res. M.O. and H.P., each at rate of £150. Also H.S. and Cas. O., each at rate of £100.
Manchester Ancoats Hosp.—Orthopædic Registrar, £50.
Manchester Royal Eye Hosp.—Out-patient M.O., £200.
Manchester Royal Infirmary.—Chief Asst. to Surg. Unit, £250.
Manchester, Withington Hosp.—Res. Obstet. O., £350. Also Res. Surg. O. and Asst. Res. Obstet. O., each at rate of £250.
Middlesbrough Education Committee.—Asst. School M.O., £500.
Mount Vernon Hosp., Northwood.—H.S., at rate of £150.
National Hosp., Queen-square, W.C.—Registrar and Asst. Registrar, each £200.
National Temperance Hospital, Hampstead-road, N.W.—H.P. at rate of £100.
New Zealand, New Plymouth Hosp.—Res. Surgeon, £900. Also Radiologist, £850.
Nottingham City Hosp.—Res. Asst. Surg. O.'s, each at rate of £250.
Nottingham General Hosp.—Res. Cas. O., at rate of £150.
Oxford, Radcliffe Infirmary.—Surg. Reg., £400. Also H.S. for Gynæcological ward, £120.
Paddington Metropolitan Borough.—Sen. Visiting M.O. for Ante-Natal Clinic, 2 guineas a session.
Plymouth City and General Hosp.—Jun. Asst. M.O., at rate of £250.
Plymouth, Prince of Wales's Hosp., Greenbank-road.—Res. Surg. O., at rate of £225.
Portsmouth City.—Asst. M.O.H., &c., £500.
Queen Charlotte's Maternity Hosp., Marylebone-road, N.W.—Res. Anæsthetist, £100. Res. Anæsthetist and Dist. Res. M.O. at rate of £90. Also Asst. Res. M.O., at rate of £80.
Queen's Hosp. for Children, Hackney-road, E.—Cas. O., at rate of £100.
Reading, Royal Berkshire Hosp.—H.S. to Spec. Depts., at rate of £150.
Richmond, Surrey, Grove-road Institution.—Res. Asst. M.O., at rate of £250.
Rochdale Infirmary and Dispensary.—Second H.S., £150.
Royal Cancer Hosp., Fulham-road, S.W.—Two H.S.'s, each at rate of £100. Also Res. H.S. to Radium Dept.
Royal College of Physicians of London.—Charles Murchison Scholarship, 20 guineas.
Royal Free Hosp., Gray's Inn-road, W.C.—Sen. Res. M.O., £150.
Royal London Ophthalmic Hosp., City-road, E.C.—Asst. Surgeon.
Royal Naval Medical Service.—Medical Officers.

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Royal Northern Hosp., Holloway, N.—Obstet. Reg., £200.
St. Bartholomew's Hosp., E.C.—Part-time Chief Asst. in X Ray Diagnostic Dept.
St. Mary's Hosp. for Women and Children, Plaistow, E.—Res. H.P., at rate of £150.
Sheffield Royal Infirmary.—Ophth. H.S., at rate of £120.
Southampton County Borough.—Temp. Asst. M.O.H. for Air-raid Precautions, £500.
Stafford County Mental Hosp.—Med. Supt., £1100.
Stafford, Prestwood Sanatorium.—Jun. Asst. M.O., at rate of £300.
Staffordshire County Council.—Second Asst. Bacteriologist and Pathologist, £700.
Staffordshire General Infirmary, Stafford.—H.P., at rate of £150.
Stirling District Mental Hosp., Larbert.—Jun. Asst. M.O., £300.
Stockport County Borough.—Asst. M.O., £600.
Stoke-on-Trent, Burslem, Haywood, and Tunstall War Memorial Hosp.—Res. H.S., at rate of £175.
Stoke-on-Trent City.—M.O. for V.D. Centre, £750.
Stoke-on-Trent, North Staffordshire Royal Infirmary.—Res. Anæsthetist, at rate of £150.
Stoke-on-Trent, Stanfield Sanatorium.—Res. M.O., £250.
Tottenham Borough.—Deputy M.O.H., £750.
Warrington Infirmary.—Part-time Radiologist, £200.
Weir Hosp., Grove-road, Balham, S.W.—Jun. Res. M.O., £150.
West London Hosp., Hammersmith-road, W.—Chief Asst. to Dept. for Chronic Rheumatic Diseases, £100. Additional Hon. Reg. for Throat, Nose, and Ear Dept. Also Hon. Clin. Asst. in X Ray (Diagnostic) Dept.

The Chief Inspector of Factories announces a vacancy for a Certifying Factory Surgeon at Kirkby Stephen (Westmorland).

Medical Diary

May 2nd to May 8th

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY.

Orthopædics. 5.30 P.M. (cases at 4.30 P.M.), annual general meeting. Mr. A. Rocyn Jones: (1) Spinal Compression Fracture. Mr. E. P. Brockman: (2–4) Radiographs of Three Cases of Cavities in the Body of the Astragalus. Mr. G. O. Tippett: (5) Cysts in the Carpal Scaphoid and Radial Styloid. Mr. John Bastow: (6–8) Fracture of the Upper End of the Tibia. (9) Subtrochanteric Fracture of the Tibia treated by Smith-Petersen Nail. Mr. Norman Capener: (10) Brachial Vascular Disturbance following Injury. (11) Smith-Petersen Nail; a Surgical Accident. (12) Fracture-dislocation of Ankle. (13) Spondylolisthesis. (14–15) Radiographs of Tuberculous Spines. Mr. K. H. Pridie: (16) Pathological Fracture of a Humerus. Mr. B. Whitchurch Howell: (17) Arthroplasty of the Finger.

WEDNESDAY.

History of Medicine. 5 P.M., annual general meeting. Sir StClair Thomson will show sketches by Spy of eminent Victorian physicians. Dr. J. H. Thompson: Treatise on the Effects and Various Preparations of Lead, Particularly of the Extract of Saturn, for Different Chirurgical Disorders. Prof. J. Burton Cleland: Australian Convict Doctors.

Surgery. 5.30 P.M., annual general meeting. Prof. G. Grey Turner: Non-malignant Stenosis of the Œsophagus. (Presidential address.)

FRIDAY.

Otology. 10.30 A.M. (cases at 9.30 A.M.), annual general meeting. Prof. Hugh Cairns and Mr. C. S. Hallpike: Pathology of Ménière's Syndrome. Mr. A. J. Wright: Labyrinthine Destruction in the Treatment of Vertigo.

Laryngology. 4.45 P.M., annual general meeting. Dr. G. E Hodge (Montreal): Relation of Bronchiectasis to Infection of the Paranasal Sinuses. Dr. J. Pressman (Los Angeles) will show a film on the movements of the larynx.

Anæsthetics. 8.30 P.M., annual general meeting. Dr. A. P. Cogswell, Dr. John T. Hunter, and Dr. J. Harris: clinical reports.

Neurology. Meeting in Brussels.

SATURDAY.

Neurology. Meeting in Antwerp.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.

FRIDAY.—8 P.M. (West London Hospital, Hammersmith-road, W.), clinico-pathological meeting.

BIOCHEMICAL SOCIETY.

SATURDAY.—2.45 P.M. (Department of Biochemistry, Oxford), short communications and demonstration.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

UNIVERSITY OF LONDON.

WEDNESDAY.—5.30 P.M. (King's College, Strand, W.C.), Prof. Pol Gerard: Comparative Histophysiology of the Vertebrate Nephron.

UNIVERSITY OF DUBLIN.

WEDNESDAY.—5 P.M. (School of Physic, Trinity College), Sir Henry Dale, F.R.S.: Chemical Agents Transmitting Nervous Excitations. (John Mallet Purser lecture.)

LONDON SCHOOL OF DERMATOLOGY, 5, Lisle-street, W.C.

MONDAY.—5 P.M., Dr. M. Sydney Thomson: Animal Diseases Communicable to Man.
TUESDAY.—5 P.M., Dr. H. Corsi: Diseases of the Nails.
THURSDAY.—5 P.M., Dr. J. M. H. MacLeod: Ringworm Infections.
FRIDAY.—5 P.M., Dr. L. Forman: Alopecia.

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane-road, W.

MONDAY.—2.30 P.M., Sir Edmund Spriggs: Diseases of Small and Large Intestine.
WEDNESDAY.—Noon, clinical and pathological conference (medical). 3 P.M. clinical and pathological conference (surgical).
THURSDAY.—2.15 P.M., Dr. Duncan White: radiological demonstration. 3.30 P.M., Miss Louisa Martindale: Radiation Therapy in Gynæcology.
FRIDAY.—2 P.M., clinical and pathological conference (obstetrics and gynæcology).
Daily, 10 A.M. to 4 P.M., medical clinics, surgical clinics and operations, obstetrical and gynæcological clinics and operations.

ST. MARY'S HOSPITAL, W.

TUESDAY.—5 P.M. (Institute of Pathology and Research), Sir Thomas Lewis, F.R.S.: Some Observations upon Ischæmic Paralysis of Nerves in Man.

NATIONAL HOSPITAL FOR DISEASES OF THE HEART, Westmoreland-street, W.

TUESDAY.—5.30 P.M., Dr. J. M. H. Campbell: Paroxysmal Tachycardia.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.

THURSDAY.—2 P.M., Mr. T. Twistington Higgins: Urinary Obstruction. 3 P.M., Dr. W. W. Payne: The Care of the Diabetic Child.
Out-patient clinics daily at 10 A.M. and ward visits at 2 P.M.

ST. GEORGE'S HOSPITAL, S.W.

THURSDAY.—5 P.M., psychiatric demonstration.

ST. JOHN CLINIC AND INSTITUTE OF PHYSICAL MEDICINE, Ranelagh-road, S.W.

FRIDAY.—4.30 P.M., Dr. Albert Eidinow: Uses of Diathermy in Surgery.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY to SUNDAY.—MAUDSLEY HOSPITAL, Denmark-hill, S.E., afternoon course in psychological medicine.—GORDON HOSPITAL, Vauxhall Bridge-road, S.W., all-day course in proctology.—ST. JOHN'S HOSPITAL, 5, Lisle-street, W.C., afternoon course in dermatology (open to non-members).—BROMPTON HOSPITAL, S.W., Sat. and Sun. course in chest diseases.

MANCHESTER ROYAL INFIRMARY.

FRIDAY.—4.15 P.M., Dr. A. Ramsbottom: clinical demonstration.

Births, Marriages, and Deaths

BIRTHS

CURTIS.—On April 22nd, at Welbeck-street, W., the wife of Dr. Herbert Curtis—a daughter.

DAWKINS.—On April 19th, at Eton-avenue, N.W., to Dr. Sylvia Dawkins (née Ransford), the wife of Dr. C. J. Massey Dawkins—a daughter.

ELLIS.—On April 23rd, the wife of Mr. V. H. Ellis, F.R.C.S.—a daughter.

HUNT.—On April 18th, at Madras, the wife of Captain R. S. Hunt, R.A.M.C.—a daughter.

JOHNSTON.—On April 13th, at Mhow, Central India, the wife of Captain Robert Johnston, R.A.M.C.—a son.

JORDAN.—On April 16th, the wife of Dr. Hector Jordan, of Mayfield—a daughter.

LLOYD.—On April 18th, the wife of Dr. T. E. Seymour Lloyd, of Luton—a son.

SOUTHWELL-SANDER.—On April 25th, at Welbeck-street, W., the wife of Dr. G. A. Southwell-Sander—a son.

MARRIAGES

ABRAHAM—NELSON.—On April 19th, at Harpenden Parish Church, John C. G. Abraham, M.R.C.S., to Cicely Mary Nelson.

PORTER—CURTIS.—On April 21st, at Stoke Newington, David Cuthbert Porter, M.D., to Phyllis Gertrude Mary Curtis.

RAMSDEN—CLARKE.—On April 21st, 1938, at Brenchley, Walter Maurice Ramsden, M.D., M.R.C.P., to Margaret Joy Clarke.

DEATHS

BARRETT.—On April 21st, suddenly, Alfred Keppel Barrett. M.R.C.S. Eng.

BOND.—On April 23rd, at Polesworth, Warwickshire, Nathaniel Troughton Bond, M.B. Edin., aged 69.

COATS.—On April 26th, in London, Douglas Hamilton Coats, M.B. Glasg., Major R.A.M.C., of Glasgow.

CURTIN.—On April 21st, Eugene Curtin, M.D., M.Ch. R.U.I., late of Bournemouth.

DOLAMORE.—On April 19th, at Ealing, William Henry Dolamore, F.R.C.S. Eng., L.D.S., aged 74.

FEARNLEY.—On April 23rd, suddenly, at Nice, Jonathan Fearnley, M.R.C.S. Eng., aged 67.

FISHER.—On April 22nd, at Brierley Hill, Frederick Pearson Fisher, M.C., M.B. Lond.

KAY.—On April 20th, at Glasgow, Thomas Kay, D.S.O., J.P., M.B., F.R.F.P.S. Glasg., of Machrihanish, Argyll.

MONTFORD.—On April 23rd, at Upton-on-Severn, James Montford, M.R.C.S. Eng., L.R.C.P. Edin.

NOLAN.—On April 24th, at Farnham, Surrey, Chaworth Louis Nolan, M.B. Dub., Surg.-Comdr., R.N. (ret.), aged 80.

ORAM.—On April 22nd, at Wandsworth Common, Richard R. W. Oram, M.R.C.S. Eng., in his 86th year.

SCOTT.—On April 21st, at St. Albans-road, N.W., Alexander Thomas Scott, M.B.E., M.R.C.S. Eng., in his 89th year.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

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NOTES, COMMENTS, AND ABSTRACTS

DOMESTIC AIR CONDITIONING

AUTOMATIC adjustment of temperature and humidity, coupled with continuous admission of fresh filtered air, is playing an increasing part in the efficiency of factories and workshops, and in the amenities of hotels and places of amusement. Messrs. Carrier Weathermakers Ltd. (27, Conduit-street, London, W.1.) have had on the market during the last eighteen months a portable apparatus for producing the same result on a smaller scale, implementing what they describe as a self-contained electrical weathermaker which can be fitted in any room of a private house or office. We have had an opportunity of examining this apparatus which is about the size of a large radio-gramophone and plugs into an existing power point. Apart from this only a small window duct or wall opening is required. It is practically silent in operation, the noise level being below that of an ordinary desk fan, and, as the system requires closed windows, the noise of outside traffic is shut out. The unit filters the incoming air of dust and smoke, warming it in winter and cooling it in summer, adjusting also the humidity within reasonable limits. At the same time it circulates the air in the room. The makers speak of resolving a foggy November afternoon or a sultry summer day into the exhilarating conditions of a fresh spring morning in the country—and unquestionably the atmosphere in the demonstration room was pleasant. Inspection of a filter due to be changed revealed a black charred appearance contrasting with the golden yellow colour of the fresh one. A water-cooled model which requires connexion with the mains has a cooling capacity of one-tenth more than the air-cooled model. The current consumed amounts to three-quarters of a unit per hour in the summer and one unit in the winter. The price of the model including installation (apart from constructive work) is 99 guineas for year-round functions or 88 guineas without provision for heating or humidifying.

In medicine the possible uses of such an air-conditioning plant are manifold. It may prove helpful to those who suffer from allergic diseases, such as asthma or hay-fever, and who are sensitive for a limited period of the year to pollens and other dusts. During severe weather it might bring some relief to the chronic bronchitic, especially one with secondary superadded bronchial spasm; the controlled atmosphere should reduce the number of attacks of broncho-pneumonia to which these patients are liable. Confinement during the bad season to such an air-conditioned room might be preferred to banishment from town at the first November fog and cost less. Since it is possible by a small addition to increase the humidity above the normal, the unit might have a further place in the early treatment of an attack of acute bronchitis. It should be useful in the nursing of chest cases after operation; not uncommonly a thoracoplasty patient is lost from intercurrent respiratory infection during a sudden fog. A further use for a thermostatic chamber would be after removal of the thyroid gland in a thyrotoxic patient in the hot season which these patients stand so badly. Such an air-conditioning plant has, we understand, been installed at Guy's and the London Chest Hospitals.

We may not have arrived, the makers admit, at the stage when every housewife is in a position to manufacture her atmosphere, and in this country at all events current medical teaching would deprecate over-protective measures in the domestic sphere. Those who have been brought up in the school of Otto Walther would aim rather at rendering the delicate chest insusceptible to things like chill and stuffiness. Nevertheless the sphere of such a portable air-conditioning plant should be wide enough without turning us into a nation of valetudinarians.

HOSPITAL LIBRARIES IN IRELAND

ON the initiative of the Library Association of Ireland a Hospital Library Council was formed last year after prolonged negotiations with the Free State Government, which agreed to make a grant of £10,000 from the funds of the Irish Hospitals Sweepstakes to cover a period of three years. An office was acquired at 49, Upper Mount-street, Dublin, with an organising librarian and an assistant. From the outset it had been maintained that the service should be controlled by trained professional librarians and, as the first salient point in its policy, the Council decided that the service to be effective must be organised on technically sound lines and follow the procedure adopted in public libraries. The first annual report of the Council to the end of 1937 shows that 7000 volumes have been purchased for the general repository under the direction of the book selection committee, of which half the members are medical men. Thirty-eight hospitals had applied by Dec. 31st for books, which are sent out in parcels according to the number of beds and may be retained indefinitely or exchanged periodically in whole or in part for a fresh supply. Books must be in the charge of a reliable person, and although at present this responsibility devolves upon voluntary helpers the Council adds that "the desirability of the larger hospitals engaging the services of persons trained in library technique to take charge of their libraries cannot be too strongly urged." The efficiency of the service is secured by the right of the Council to inspect the libraries in hospitals from time to time.

FLIES IN ITALY

THE Italian Government has started an official campaign against flies. All citizens are asked to coöperate in the work, and medals and diplomas are to be awarded to the societies and organisations that show the best results. The authorities are issuing illustrated pamphlets describing the damage done by the fly and the various measures of combating it, and children in schools are to have lessons on the subject. The districts where flies largely breed will have special attention from the local authorities, who are to impress upon the local property-owners the necessity to take action.

FIRST AID UP TO DATE

AN advanced handbook of "first aid," originally published in 1901, is now in its 187th thousand.[1] Apart from a few minor corrections, the chief change is in Chapter XIX in which 40 pages are devoted to gas poisoning in warfare. The chapter is based on the official Air-raid Precaution Handbooks and deals briefly with every aspect of gas warfare from the point of view of the trained non-medical civilian. The book is excellently produced and profusely illustrated, but would benefit by still more drastic revision of some of the advice handed on from earlier editions—e.g., "Prussic Acid . . . administer Stimulants *ad lib.*, and Emetics, if necessary by an enema."

CRYSTALLINE SECRETIN: A CORRIGENDUM.—In an annotation on April 9th (p. 851) we attributed the production of pure crystalline secretin, and of an amorphous non-toxic secretin preparation (Pancreotest), to Agren and Lagerlöf. We are informed that in the investigations described, both clinical and chemical, the initiative was taken by Prof. E. Hammarsten, to whom reference was made in a footnote. Dr. Agren has been his assistant.

[1] Warwick and Tunstall's First Aid to the Injured and Sick. Sixteenth edition. Edited by F. C. Nichols, M.C., M.B., Ch.B., L.D.S., late Captain R.A.M.C. (T.). Bristol: John Wright and Sons; London: Simpkin Marshall. 1937. Pp. 318. 2s. 6d.

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ADDRESSES AND ORIGINAL ARTICLES

SURGICAL TREATMENT OF DETACHMENT OF THE RETINA *

By J. Cole Marshall, F.R.C.S. Eng.

CONSULTING SURGEON TO THE WESTERN OPHTHALMIC HOSPITAL, LONDON

One of the most interesting developments of modern ophthalmology is the surgical treatment of detachment of the retina, a subject that immediately recalls the wonderful work undertaken by the late Prof. Jules Gonin of Lausanne, who published his results after years of most painstaking research. Although his work attracted but little notice at first, his fame as an ophthalmologist was permanently established at the Congress of 1929 held at Amsterdam.

Gonin's theory of the causation of retinal detachment was based on the assumption that the essential lesion in these cases was a tear or hole in the retina. I well remember in 1930 his enthusiasm when he showed me a beautiful specimen of an eye depicting a retinal detachment with a small hole in it; close to the hole was a small piece of retinal tissue attached to the vitreous by a small thread of fibrous tissue. He was able to show that closure of the tear by surgical means was followed in a large proportion of cases by cure of the condition. Although there may still be surgeons who do not agree with this view, the great majority of ophthalmologists believe that the theory is correct and their belief is supported by practical experience.

EVOLUTION OF METHODS

Gonin's original technique included the use of a Paquelin cautery which was heated to a dull red heat and plunged through the sclera, choroid, and retina, at the point corresponding to the position of the tear. By this means a choroido-retinal scar 3–4 mm. in diameter was formed, a scar that was in some ways superior to those produced by other methods. This operation, however, had definite limitations, since as a general rule only one puncture could be made at a time, thereby preventing its use in extensive lesions, and in any case entailing the most exacting work in localising and marking the tear.

Modifications of the method were soon invented, including the use of a fine galvanocautery point, with which surface coagulation could be carried out, or several punctures made, without serious loss of inter-retinal fluid. This technique fell into disrepute because neither the temperature of the point, nor the time of its application was constant, and complications ensued. Its use has lately been reintroduced in certain suitable cases.

To avoid the unpleasant sequelæ of introducing a red-hot point into the eye, attempts were made to produce a plastic choroiditis by chemical methods, such as infiltration of a weak solution of potassium hydroxide between the choroid and sclera or by exposing the choroid by means of multiple trephine holes and touching it with a stick of solid caustic potash, the excess of the caustic potash being neutralised by a solution of 0·5 per cent. acetic acid. Drainage of the inter-retinal fluid was effected by puncturing the choroid in a third of the total number of openings made. Although such methods have now been largely abandoned, they are still in use in certain clinics.

Almost coincident with these methods was the introduction of surgical diathermy as a means of treatment.

A coagulating current is used, applied either superficially or by a needle point introduced through the outer coats of the eye. Surface coagulation is applied by a ball electrode 2–3 mm. in diameter, a fine point, or a blunt point 2 mm. across, attached to a thermocouple which enables the operator to estimate the exact temperature to which the sclera is raised. The inter-retinal fluid is drained by trephining the sclera and puncturing the choroid with a blunt instrument or by the use of perforating diathermy applied by means of a fine Weve or Safar electrode. This technique involves the use of sufficient heat to coagulate the choroid and great care must be taken not to allow excessive burning with subsequent vitreous hæmorrhage due to necrosis of retinal vessels.

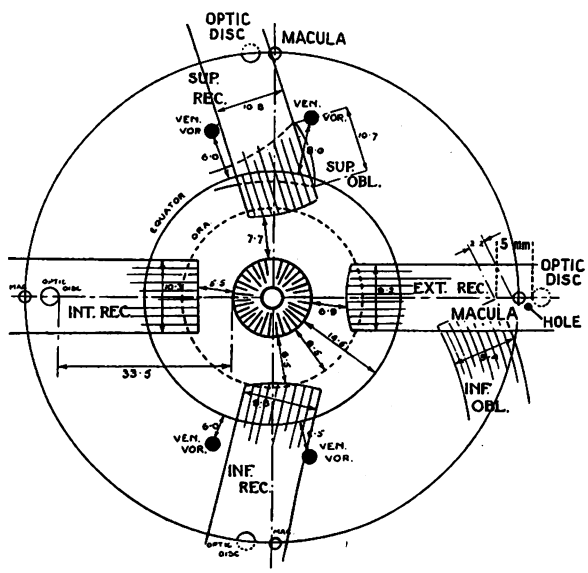

FIG. 1.—Author's chart for mapping out retinal tears. The small hole described in Case 2 is shown on the extreme right (see also Fig. 9 A).

Perforating diathermy has been carried out consistently in many clinics and its use has been attended with considerable success. By this method the choroid can be coagulated without damage to the retina and with minimal damage to the sclera, though if the retina is touched with a diathermy point, a fine artificial hole may be produced. Trephining is unnecessary when this technique is employed, since adequate drainage of the inter-retinal fluid takes place through the diathermy punctures.

In recent years a low tension electrolytic current has been used in the treatment of retinal detachment. By this method fine silvery bubbles are produced in the vitreous, and a certain amount of scarring takes place in the retina and choroid along the track of the electrolytic needle. Although the production of bubbles is of the greatest possible service in the exact localisation of retinal lesions, the scars produced do not appear to be strong enough to effect a cure.

A method has recently been devised which combines the advantages of both the diathermic and electrolytic methods, without certain of their drawbacks.

* Hunterian lecture delivered before the Royal College of Surgeons of England.

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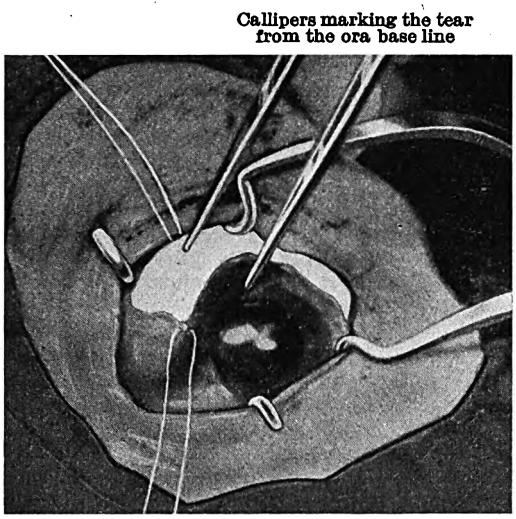

FIG. 2.—Marking the position of the tear on the exposed sclera. The eye is turned downwards. [My thanks are due to Messrs. C. Davis Keeln Ltd. for their care in the preparation of the cinematograph film from which these illustrations were taken.]

Short needles, 0·5–1·0 mm. in length, are used with a coagulating diathermic current. Since these points are not long enough to penetrate into the inter-retinal space, coagulation of the choroid can be carried out without loss of inter-retinal fluid. Drainage is then established by perforating the sclera and choroid by means of needles 1·5 mm. in length, carrying an electrolytic current. The circuit is arranged so that these points form the cathode and, if the retina is perforated, the hole is immediately closed by the action of the hydroxyl ions produced. This appears to be the safest method evolved up to the present time.

INVESTIGATION AND EXAMINATION

Before passing on to a detailed description of the technique of this operation, the importance of the subjective symptoms of detached retina must be stressed, as they are of the greatest help in ascertaining the situation of the tear and deciding the prognosis of the operation. If symptoms are noticed early enough, they may enable the surgeon to avert an actual detachment by prescribing treatment suitable to individual cases.

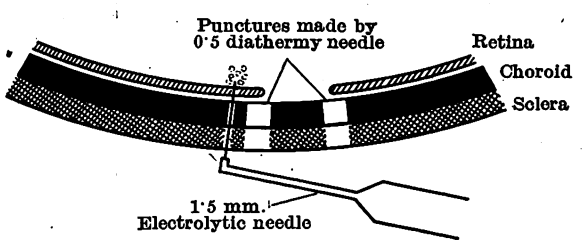

FIG. 3.—Diagram of type of punctures made by diathermy and electrolytic needles.

Past injuries must be inquired into, for they may cause degenerative changes and cystic formations in the periphery of the retina even after the lapse of years. In such a case, the peripheral, rather than the equatorial, zone must be searched.

Among the earliest symptoms are flashes of light, floating bodies, cloudy movements, changes in colour vision and in the apparent size and shape of objects, the latter occurring especially in œdema and degenerative changes in the region of the macula. The first loss of visual field or the apparent position of floating bodies are of the utmost importance in showing where the detachment started, especially in those cases where a vitreous hæmorrhage has supervened before the patient comes for examination.

In all cases, the state of the near and distant vision should be recorded and fields carefully charted. The external appearance of the eye must be noted and the tension estimated, since hypotonia renders success of the operation less likely. The reaction of the pupil, and the degree of dilatation, after the instillation of a mydriatic should be observed, since poor dilatation not only hinders examination but often tends towards a poor prognosis. Suitable mydriatics are homatropine and cocaine, mydricaine, or Lævo-Glaucosan.

Preliminary examination with a plane mirror often gives useful information about the situation of the detachment and the state of the ocular media. A general view of the fundus is obtained by the indirect method and a careful drawing of the inverted image made—a method of great value when investigating the extreme periphery of the retina. The usefulness of this examination is greatly enhanced by employing a lamp of approximately 200 candle-power and a + 20 D.S. lens. The area of retina corresponding to the patient's first visual loss is then examined with a self-illuminated ophthalmoscope, and the depth of the detachment noted in dioptres. The refraction at the optic disc is also estimated. The most probable situation of the tear may be surmised by observing the outline of the detachment. A horizontal line below the disc is in favour of a lesion in the lower part of the retina —e.g., a disinsertion—while a globular detachment divided into pockets suggests a hole in the upper half of the fundus. The retina should be searched with lenses of varying strength, for this often enables a tear to be found that would otherwise be overlooked, and help may be obtained by using a concentrated ophthalmoscope beam. Pre-existing macular changes must be looked for. The course and contour of the retinal vessels should be recorded, especially when passing over grey areas, because they may indicate a fold in a very slightly detached retina. Patches of choroiditis and grey areas should be observed, since small tears are often found near choroidal pigment, at the edge of a grey patch, or among streaks in degenerated areas. A detailed sketch of the fundus should be made after the examination, and an exact drawing of the tear and its relation to vessels, pigment, &c., is a great help during the operation.

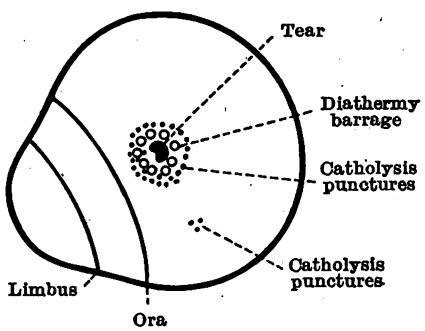

FIG. 4.—Diagram showing position of punctures.

In addition, the size, shape, and position of the tear is transposed to a special chart of the outer coat of

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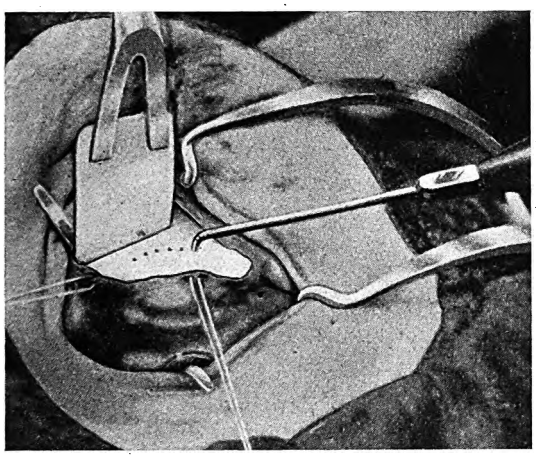

FIG. 5.—Diathermy needle (0·5 mm.) making barrage of punctures.

the eye on which the extra-ocular muscles, venæ vorticosæ, &c., are plainly shown (Fig. 1).

INDICATIONS AND CONTRA-INDICATIONS

As soon as a diagnosis of retinal detachment is made, and a tear found, an operation should be performed, as early operation invariably carries a better prognosis. Very large or multiple tears are no contra-indication, though the outlook is more serious in these cases. Age should be no bar to operation provided that the patient's mental and physical condition allows confinement to bed for a sufficient time. Although vitreous hæmorrhages may delay treatment, operation—preferably by diathermic coagulation—should be carried out as soon as absorption has taken place. Aphakia renders the examination more difficult and increases the danger of interference, but even in such cases a satisfactory result may be obtained. When retinal detachment is complicated by secondary glaucoma, a successful operation may be performed after the tension has returned to normal.

Certain contra-indications to operation must be borne in mind. Secondary detachments, due to neoplasms or retinitis proliferans must, of course, be excluded. The length of history and the condition of the retina may both affect one's decision. Cases showing a very large disinsertion with inverted edges should only be operated on if the other eye is hopelessly blind. A detachment in the lower part of the fundus, not obscuring the macula, should not be treated surgically if it appears to be in a stable condition, especially in elderly patients.

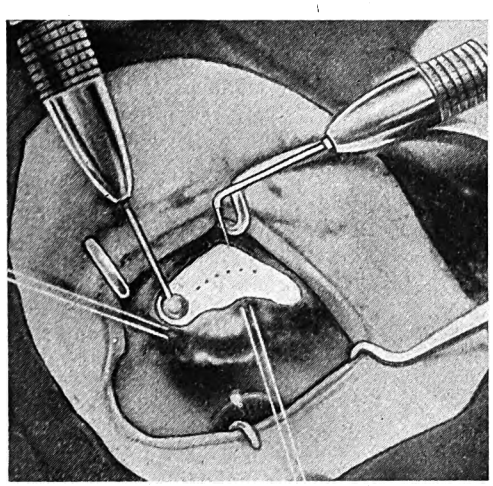

FIG. 6.—Localising the tear with a 3·0 mm. cathode needle, using a ball-electrode in anode.

TECHNIQUE OF OPERATION

The patient is put to bed for two or three days before operation to allow careful examination of the eye under standard conditions. The meridian of the tear is marked with indian ink on the corneoscleral junction, as this leads to greatly increased accuracy of technique. Although a general anæsthetic is unnecessary, Omnopon gr. $\frac{1}{3}$ and scopolamine gr. 1/150 are administered an hour before the patient is brought to the theatre. In this way, some degree of coöperation by the patient is retained.

I now propose to describe in detail the operative technique, illustrated originally in my lecture

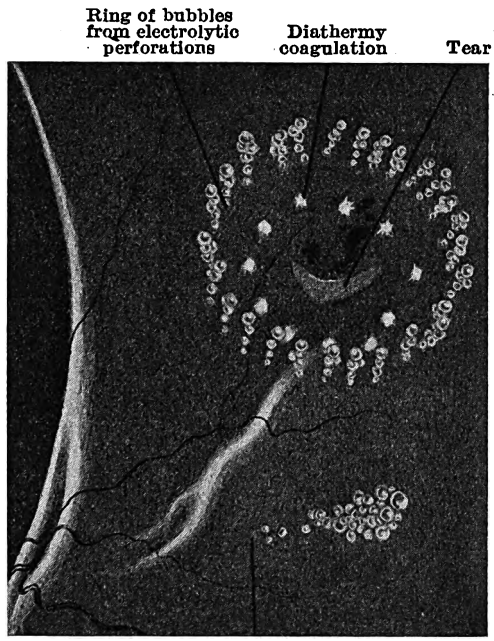
Ring of bubbles from electrolytic perforations
Diathermy coagulation
Tear
Bubbles from an extra electrolytic puncture to let out fluid

FIG. 7.—Appearance of fundus immediately after completion of the puncture.

by means of a film. Cocaine or Pantocaine are not used, as sufficient anæsthesia is produced by a subconjunctival injection of Novocain and adrenaline. By this means the transparency of the cornea is not affected though desiccation must be prevented by repeated instillation of saline.

The conjunctiva and episcleral tissues are carefully incised in the region of the ora serrata—adequate exposure is of the greatest importance. The rectus muscles are then defined and, if necessary, divided. The position of the ora serrata is marked in indian ink and this is used as a base line for measuring and marking the limits of the tear (Fig. 2). If necessary, a retraction suture can be placed at the ora.

The selection of the diathermic and electrolytic points depends on the individual case and the area of the eye involved—e.g., a shorter needle is used

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under the rectus muscles where the sclera is thin. Diathermy needles may be straight or angled and vary between 0·5 and 1 mm. in length. For localisation of the tear, an electrolytic needle 3 mm. long is usually sufficient, unless the displacement of the retina is extreme. Shorter electrolytic needles, 1·5 mm. in length, are used for drainage of the inter-retinal fluid (Fig. 3).

The position of the tear is surrounded by diathermy punctures 2 mm. apart (current 40 mA.) and these punctures may be carried back to the ora in suitable cases (Fig. 4). Before or after the application of diathermy (Fig. 5), localisation is checked by the introduction of the 3 mm. electrolytic needle (current 4 mA.) for 1 sec. (Fig. 6) and examination of the vitreous for the presence of bubbles (Fig. 7). Should the localisation be accurate, the inter-retinal fluid is then drained by repeated punctures with a 1·5 mm. electrolytic point (current 3 mA.) (see Fig. 3). If sufficient fluid does not appear, a thicker needle may be used, or perforation by a longer diathermy point or even a galvanocautery. When the latter is used, a circle of superficial cauterisation is made, through the centre of which the cautery is plunged. Repeated ophthalmoscopic examination should be made during the operation and, for this purpose, a sterile cotton gauntlet is used when holding the instrument. Finally, any divided muscle is sutured and the conjunctival edges brought into accurate position. Catgut sutures are used throughout. Gutt. atropine 1 per cent. and gutt. argyrol 20 per cent. are instilled and both eyes are bandaged, a metal shield being placed over the operated eye.

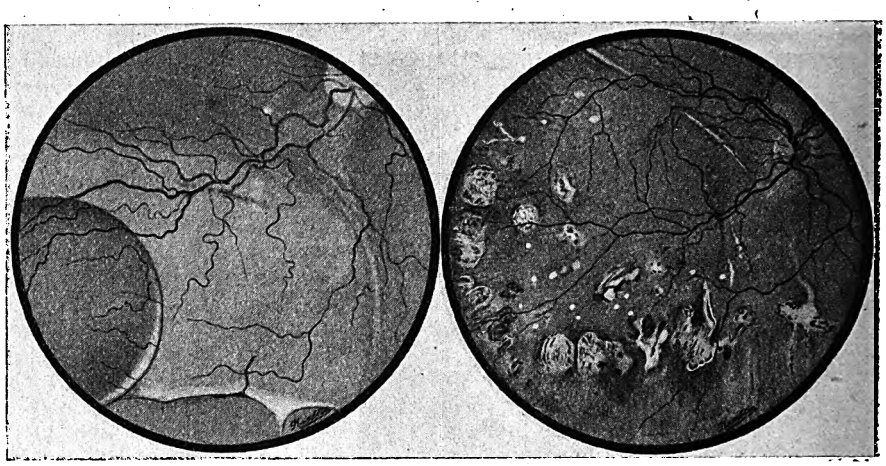

FIG. 8.—Fundal appearance in Case 1. (A) Before operation; showing serous detachment with large cyst. (B) After treatment.

After-treatment.—When the patient has returned to bed, the head should be so placed that the vitreous presses on the region of the tear. Only a light diet is allowed for the first four or five days. If the patient appears comfortable, the first dressing is not carried out until the 4th day and, should everything be satisfactory, the eye is then redressed every second day. A detailed fundus examination should not be made until the end of the first week. On the 14th day Lochbrille (opaque spectacles with a central opening) can replace the bandages. The patient is allowed out of bed on the 21st day and leaves hospital at the end of the month. Breathing exercises, active movements of the legs, and massage are useful during convalescence, but care must be taken to avoid excessive disturbance, especially during the third week.

ILLUSTRATIVE CASES

Two typical cases treated by this method may now be described.

CASE 1.—A boy of 16. Loss of vision of right eye for one year. Typical serous detachment with a large cyst situated peripherally and an extensive disinsertion in the lower part of the fundus (Fig. 8A). Treated by diathermy and electrolysis. Complete reposition of retina with collapse of cyst and obliteration of the disinsertion (Fig. 8B).

CASE 2.—A man of 59. Myopia of 20 D. Loss of vision of left eye for one month. Extensive bullous detachment below with a hole between the optic disc and the macula, shown diagrammatically in Fig. 9A. Treated by diathermy and electrolysis. The sketch shows the retina replaced and the hole closed (Fig. 9B). The large diathermy scars and small electrolytic punctures can be seen in the figure.

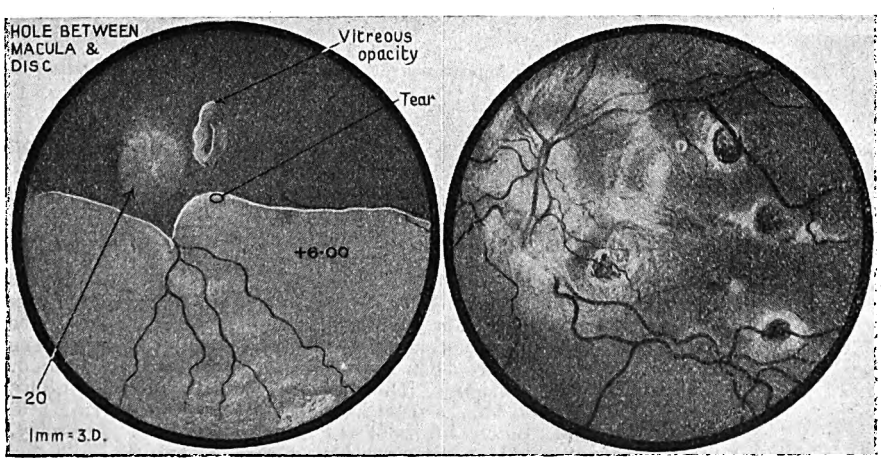

FIG. 9 (Case 2).—Bullous detachment; hole between disc and macula (shown also in Fig. 1). The small scars are from electrolytic punctures and the large from diathermy.

SUMMARY

(1) A short appreciation is given of Gonin's epoch-making work in treating detachment of the retina.

(2) Various methods that I have tried during the last eight years are described. These include thermocautery; galvanocautery with fine points; injection of chemical agents; diathermy surface coagulation; perforating diathermy; electrolysis; and combined diathermy and electrolysis.

(3) The combined diathermy and electrolytic method is detailed, with the indications and contra-indications for operating.

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(4) Two typical cases are reported, with illustrations, showing the type of scars produced by short diathermy and electrolytic points, and showing the use of the method where the tears are situated peripherally, or actually, at the posterior pole of the globe.

DIET AND INTERNAL TREATMENT IN SKIN DISEASES *

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Anyone who has been consulted by a patient suffering from skin trouble knows that the question most frequently asked by the patient is "What must I eat?" or perhaps more often "What must I not eat?" To the lay mind a diet is essential for the treatment of skin diseases, and when the doctor fails to suggest one there are always numerous friends or relations ready to oblige with advice. It is clearly incumbent upon us as medical men to make up our minds whether this popular demand for a diet is well founded and, if so, what kind of a diet is desirable.

Sometimes dietary restrictions are obvious both to the patient and the doctor, as when a patient gets urticaria every time he eats lobster or strawberries. These are the simple and, unfortunately, the rare cases in which the forbidding of a single article of diet cures the condition. But we are on much more debatable ground when we are dealing with a case of eczema or a Job suffering from pruritus. I cannot discuss here all the conditions which come to the dermatologist but will confine myself to some of the more important and consider briefly the evidence gathered by experiment and from clinical experience as to the influence of diet.

ECZEMA

The first condition with which I must deal is eczema, the commonest of all the skin reactions that we meet. I would stress first of all that eczema is not an infection, it is not something implanted on the skin from the outside but is the result of some peculiarity in the individual himself. Admittedly external factors play some part in setting the process going but it is the state of the patient's skin which is the real cause of the eczematous response. It is however very difficult to determine by biochemical or experimental methods exactly what this abnormal change in the patient's skin is. Moreover, one is impressed by the fact that biochemical methods have often yielded diametrically opposed results in the hands of different workers.

A typical example of such an investigation is the estimation of the alkali reserve of the blood. In 1928 Barber and Oriel carried out a series of investigations on cases of eczema and concluded that there was a tendency in them towards an acidosis. On the other hand, Beckman (1930) thought that patients with the allergic type of eczema were inclined to store up too great an alkali reserve, pointing out among other things that in starvation, where there is an acidosis, allergic conditions generally tend to improve. Thus Barber and Oriel, and Beckman came to exactly the opposite conclusions. Another approach to the same problem was that of Sulzberger and Mayer (1931), who investigated the influence of diet on the sensitisation of guinea-pigs to Neosalvarsan. They discovered that guinea-pigs on a winter diet easily became sensitised, but on a summer diet they were highly resistant. Further study showed that the summer diet was an alkaline diet while the winter fodder tended rather to produce acidosis, and this was the factor in the diet most concerned in controlling sensitisation. Thus Sulzberger and Mayer concluded that acidosis increased the irritability of the skin whilst alkalosis had the opposite effect. In this they agreed with Barber and Oriel. Such diverse results indicate that the problem is very complicated and that the sensitivity of the skin is not governed by a simple acid-base equilibrium.

Another important chemical relationship in the mechanism of eczema is the balance of certain metallic ions, especially those of sodium, calcium, magnesium, and potassium. Here again many apparently contradictory investigations have been carried out, both of the actual quantitative relationships of these bodies in eczematous patients and also on the clinical results of their administration internally. Certain findings do appear to be based on fairly secure ground, and one such is that if large quantities of sodium chloride are taken internally they tend to aggravate eczematous conditions. For instance Mülzer and Sörenson-Petersen (1936) gave 15 grammes of common salt to patients with neurodermatitis and all their patients were made worse usually within 24 hours but anyhow at the most in 2–5 days; in these cases the itching became so severe that the salt had to be discontinued. Furthermore it is the sodium ion in the salt that is the offender and not the chloride ion. There is also evidence that calcium, magnesium, and possibly potassium have an effect antagonistic to that of sodium by preventing the itching and exudation (Keining and Hopf 1935). The action of potassium is at times apparently antagonistic to sodium but at others it appears to antagonise calcium (Zitzke and Peters 1935). This latter action was also demonstrated by Klauder and Brown (1927) when they investigated a number of rabbits which they had divided into two groups according to whether their skin was easily irritated or not. In the skin of those which were easily irritated they found more potassium and less calcium than in the skin of the more resistant ones. This suggested that irritability was associated with diminished calcium and increased potassium. Before we can draw any conclusions we must realise that many of these experiments are rather artificial and that different varieties of sensitiveness may depend upon different chemical factors.

One further physico-chemical detail in the skin that I must mention is its fluid content. It has been shown that in eczema the skin has a higher fluid content than normally. Actually a higher fluid content occurs in the region of any inflammatory lesion, for example around an area of erysipelas. In eczema, however, this increase is found not only in the region of the lesions but also throughout the whole skin of the patient, showing that there is a general change in the patient and not simply a local lesion. Now it is possible to alter the fluid content of the skin by at least two methods. One is the giving or withholding of sodium chloride, which, if given in large enough doses, produces actual œdema. The other method is by a diet, for it is found that carbohydrates and fats increase the fluid in the skin whilst protein has the reverse effect. Finally, I

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might add a third method, which is to vary the actual fluid intake of the patient.

To summarise briefly what has been discussed above, one can say: (1) In eczema there is possibly a tendency to acidosis. (2) Excess sodium chloride favours eczema, the sodium ion being particularly important, whilst calcium, magnesium, and possibly potassium have the opposite effect. (3) Eczema is accompanied by a retention of fluid in the skin and this is promoted by carbohydrates and fats and opposed by proteins. It can also be affected by the total fluid intake of the patient.

From a consideration of the above, one can put forward some suggestions for the treatment of a case of eczema. Alkalis should be given to combat the acidosis, provided that the alkalis contain no sodium ions. Sodium chloride should be completely avoided, and in its place should be taken a mixture containing calcium, magnesium, and potassium. Personally I employ a mixture with the following formula:—

Calcium lactate
Magnesium chloride
Potassium chloride, āā 10 gr.
Aqua chlorof, ad. ½ oz.
t.d.s./p.c.

Fluid should be restricted to a moderate amount though not so as to cause thirst. Finally the diet should contain the minimum of carbohydrates and fats but should have a high protein value. Particularly to be avoided are sugar, jam, marmalade, honey, sweets, pastries, rich cakes, puddings, soups, fats, pork, bacon, sausages, excess potatoes, strong tea, coffee, beer, and wines. Plenty of lean meat should be eaten, liver at least three times a week if possible, and plenty of salads, fruits, and fresh vegetables. Milk is the best drink and is valuable not only for its protein and vitamins but also for its calcium. No salt should be taken and all cooking should be done with the minimum of salt to make the food palatable.

Before leaving the subject of eczema I want to say that in my opinion very few, if any, cases of eczema, with the possible exception of some cases of infantile eczema, are caused by specific food substances. I have yet to see a case of eczema in which the exclusion of one individual article from the diet has cleared up the condition, in contrast, I might add, to many cases of urticaria. Infantile eczema is a possible exception to the above and many dermatologists, especially in America, believe that some ingested or inhaled agent is the cause of most cases. One of their chief arguments is that if one tests these children against specific proteins such as egg-white, by the intradermal test, many of them give positive results. But many of these children react to substances with which they have never been in contact, so that it is hard to see how these substances can have caused the eczema. Moreover if one withdraws from the diet the substance to which they react, the children do not necessarily get better, whilst on the contrary they may get better even when continuing to take the said substance (Woringer 1930). In other words, although they give a positive intradermal reaction to a given protein, this is not necessarily the cause of their eczema. It seems more probable that these children have a highly reactive skin and that one indication of this is that they get eczema, and another, possibly quite independent, indication is that they give positive intradermal tests to one or more foreign proteins. I must admit that occasionally one meets children who do appear to be irritated by specific foods, such as eggs, or, as in a case which I saw recently, tomatoes; possibly the primary irritability of the skin in these cases is caused by a reaction more closely allied to urticaria than eczema, the latter being a secondary, superadded manifestation due to external friction. One can, therefore, occasionally help matters in cases of infantile eczema by searching for such substances and by excluding likely things from the diet in rotation though in actual practice one is not often successful. In those cases where the exclusion of a single article of diet has helped, this has usually been so obvious that the mother has already known about it. In the majority of cases specific dietary restrictions do not appear to help.

URTICARIA

I turn now to urticaria, which is a rather simpler subject than eczema. It is supposed that when the correct antigen gets into the circulation, it unites with the specific antibody in the dermis and the combination of antigen and antibody leads to the release of the H-substance which in turn produces a weal. But if we investigate a series of patients with urticaria in order to find what specific protein or other body is causing the urticaria, we shall discover that in only a certain proportion can such a body be found. Thus for example Hopkins and Kesten (1934) investigated 214 cases with great care, and in only 12 were they able to find a definite substance which when taken by the mouth produced weals or the exclusion of which caused the urticaria to disappear; in 34 more, food was thought to be a probable cause. In the larger remaining group alimentary factors did not appear to play a part. These cases are those that develop urticaria when they are nervous or when they get hot or after exercise, &c. There are thus two groups of people suffering from urticaria, one in which a definite alimentary cause is present, and one in which it is not.

How therefore should we deal with a case of urticaria? I suggest first of all a thorough investigation of the patient's diet; he should keep a diary, on one page of which he should put down everything he eats and on the opposite page whenever he gets an attack. He can also have intradermal tests with things he commonly eats. If this does not give any help and his condition is severe, he should be put on an almost starvation diet consisting only of milk until his urticaria subsides. Then he should have gradual additions to his diet and perhaps one may find that following the ingestion of a specific substance his urticaria will break out again. In a proportion of cases one will be successful in this way and by simply banning a certain food one will cure the patient. This method has been worked out to an extreme degree both for urticaria and eczema by Urbach of Vienna (1932). He maintains that in both these conditions he can usually isolate a protein to which the patient is sensitive; from it he produces a simpler body which he calls "a specific polypeptide." This he administers an hour before the meal at which the protein is to be taken and he claims in this way to desensitise the patient. But his work, especially in cases of eczema, has not been fully confirmed elsewhere and his successes have been attributed by others to the severity of the restrictions of his diet (Zitzke and Peters 1935). Without going as far as Urbach with his specific polypeptides, I think one can sometimes help a case of urticaria by giving non-specific peptone half an hour before meals.

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But despite all one's trouble in searching for a specific protein, one will be left with a large group of patients whose urticaria appears to be due simply to the fact that the H-substance in their skin is more readily liberated than in the normal person. Such patients, I am sure, should not be encouraged to fix their attention continually on their food and to become dietetic faddists. Can anything be done for these patients from a dietetic point of view? Unfortunately not very much but certain drugs may help such as calcium, and also general sedatives like bromides and Luminal; I have also obtained some successes with heavy doses of iron as advocated by Chevalier and Moutier (1936). There are of course other forms of treatment such as autohæmotherapy but they do not fall within the scope of this article.

Papular urticaria of infants or strophulus deserves special mention as it is sometimes attributed to the child's diet. In 1932 Hallam reported some interesting experiments on this condition. He took a number of children suffering from strophulus into hospital; they recovered at once without treatment but relapsed immediately they returned home. If he fed them in hospital on food which they had sent in from their own homes no spots appeared. On the other hand if the children went home they developed lesions even when the food was obtained from the hospital. It is clear, without going further into these investigations, that the papular urticaria was independent of any food factor and that there appeared to be something in the home surroundings which was the determining cause of the eruption.

There is however evidence that in given surroundings a child is more liable to strophulus if it is on a diet containing excessive amounts of carbohydrates (Tate 1935), whilst, on the contrary, the administration of alkalis seems to have a beneficial effect. Actually in practice most cases of papular urticaria respond to a diet in which the carbohydrates have been reduced, together with a simple rhubarb and soda mixture before meals.

PSORIASIS

I will now refer briefly to one or two conditions which have recently been tackled along dietetic lines. The first of these is psoriasis. In 1933 Grütz and Bürger noticed that there was an increase in the lipoid and cholesterol content of the blood in patients suffering from psoriasis and that, on giving cholesterol in olive oil by mouth, there was a smaller rise in the blood cholesterol of psoriatics than of normal patients. This suggested that there was an abnormality in the fat metabolism in psoriasis and they therefore recommended a low-fat diet. They endeavoured to reduce the fats to less than 20 grammes a day by eliminating fats, oils, cream, butter, cheese, yolk of egg, &c.; this is not very difficult and the patient can remain on the diet for an indefinite time without losing weight. With this method they claimed good results and, though it did not cure patients without additional local treatment, it helped materially and kept them clear once the lesions had disappeared. However, though some cases that have improved have been reported in this country (Semon 1935), on the whole the results have been disappointing. Recently Rosenfeld and Krasnow (1937) in America published a paper in which they were completely unable to confirm Grütz's results; in fact they concluded that the fat in the blood of psoriatics was, if anything, reduced in amount. Possibly the good results obtained in Germany are associated with the high content of fat that the German diet normally contains.

SKIN TUBERCULOSIS

Another condition which has recently been treated on dietetic lines is tuberculosis of the skin. The originator of this diet was a German practitioner called Gerson and the diet has been modified since by Hermannsdorfer and Sauerbruch. Gerson (1934) believes that his diet will cure all forms of tuberculosis, including pulmonary tuberculosis. His original diet was characterised by a complete absence of salt but the diet has become modified so that now the essential feature which is stressed is that the food should be uncooked though salt is still excluded. Saltless food together with raw vegetables, &c., is apt to be very unappetising, and even Gerson found that many of his patients would not, or could not, take the diet. Even with the modified diet, the patient can only eat a small amount at each meal, so that these have to be numerous, sometimes as many as seven a day (Jesionek and Bernhardt 1930). The meals consist largely of raw fruit, raw vegetables, eggs, butter, and a little meat, milk being also allowed. With a certain amount of ingenuity these can be made into a fairly palatable mixture by mincing them up finely, but it is necessary to watch the patients to be sure that they are sticking to the diet and generally speaking it can only be used on patients in hospital.

PYOGENIC INFECTIONS

One is frequently asked if a diet is of value in certain other infections of the skin, particularly in chronic pyogenic infections such as recurrent boils. The sterilising power of the skin is partly due to the character of its secretion; this can be altered to some extent by diet so as to make the skin a less pleasant place for staphylococci. It is well known that diabetics are liable to have boils; it is probable that this is not due so much to a lowered resistance to staphylococcal infection as to the relatively high concentration of carbohydrate in the skin which allows the organisms to flourish. This explanation is not accepted by everybody and recently Pillsbury and Sternberg (1937) have carried out some interesting experiments on the relation of carbohydrates to infection. They took four series of dogs and fed one on a high-carbohydrate diet, one on a low-carbohydrate diet, one with a large amount of fat, and the last on a more or less starvation diet. They then injected staphylococci intradermally and found that in general the infection was more severe with the high-carbohydrate diet than with any of the others. This suggests that a high-carbohydrate diet diminishes the resistance of dogs to staphylococci, but of course an intradermal injection is an artificial way of infecting the skin and findings in dogs are not necessarily applicable to human beings. There is sufficient evidence, however, of the predisposing effect of carbohydrates to staphylococcal infections to warrant a definite limitation of carbohydrates in people suffering from chronic boils, &c. It is amazing how much sugar many people take simply in their tea and the mere forbidding of sugar is a useful prohibition that can be supplemented by banning potatoes, sweets, pastries and excess bread, &c.

ACNE

A similar problem is presented by acne vulgaris. Acne is an infection by organisms which are almost always present on the face of the young adult. It is only when the secretion of the glands alters in some way that the organisms can really flourish. The ideal way of treating acne would be with some glandular

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extract which would change the nature or the amount of the sebum so that the acne bacillus could not grow; at the present time we are trying to do this in Leeds with male hormone but our experience so far is not wide enough to allow us to draw any conclusions. Apart from this the most important thing is the local treatment, which should aim at removing the grease from the face and destroying the organisms. Vaccines could not be expected to alter the sebaceous secretion of the face and have proved on the whole disappointing. On the other hand the character of the sebum can be altered by the food taken, fats especially having this action. Moreover the patient can sometimes indicate certain definite foods which aggravate his acne, the most frequent of these being, in my experience, pig fat—i.e., bacon, ham, and pork. Carbohydrates and starchy foods are also usually condemned, the list of prohibited articles including chocolates, white bread, cakes, pastries, &c. This is not accepted by all, and Crawford and Swartz (1936) studied 10 cases of acne whom they put on a high-carbohydrate diet supplemented by daily intravenous injections of 1000 c.cm. of a 5 per cent. solution of glucose. None of these cases got worse and 5 improved considerably, so much so that they even advocated a high-carbohydrate diet for treatment. Still, despite this, I believe with the lay public that the girl who eats lots of chocolates and cakes will tend to have a spotty face, and I think that these should be banned together with excessive fats in all cases of acne.

SEBORRHŒA

From acne it is a short step to the difficult subject of seborrhœa. Some people have an excess of grease on their skin particularly about the scalp and face and this makes their skin unduly vulnerable, not only because of the greasiness itself which favours the growth of organisms but also because irritating dusts are more likely to cling to a greasy skin. The exact cause of seborrhœa is not known, but it is obviously connected with endocrine activity and possibly the time will come when we shall be able to control seborrhœa with a glandular preparation. An excessive intake of foods of all kinds certainly aggravates seborrhœa which is more obvious in fat people than in thin ones. The dietetic treatment of seborrhœics should be directed towards cutting down the total calories and reducing the patient's weight. This can be done best by limiting the carbohydrates and fats, which means a diet very similar to the eczema diet to which I referred above. Fluids also should be taken sparingly and beer and wines absolutely forbidden; generally speaking the diet should be plain, and stimulating foods should be avoided.

ROSACEA

The last condition to be mentioned is rosacea. Flushing of the face is often clearly associated with a gastric disturbance, but the actual gastric factor responsible for this unsightly redness is not known with absolute certainty. It was thought some years ago that it was achlorhydria, but more recent studies have shown that the percentage of cases of rosacea with notably reduced acid is only about 30 per cent., which is no higher than in a control group of patients of the same age (Brown, Smith, and McLachlan 1935). Gastric symptoms however are present in three-quarters of cases of rosacea and careful X ray examinations have shown that flushing is almost always associated with a motor disturbance of the stomach. The most common abnormality is hypotonia and dilatation of the stomach. From this we can say that the dietetic treatment of rosacea must aim at avoiding gastric upsets and especially dilatation of the stomach. Large meals should be banned and the patient should not eat when he is tired; thus it is a good thing for a patient to sit down for half an hour before his meal when he comes in from work instead of eating at once. Certain articles of diet appear to be particularly harmful and should be excluded. These include tea, especially when hot and strong, alcohol, and strong coffee, white bread which tends to produce large, doughy, indigestible masses in the stomach and which should be replaced by thin toast or Ryvita, also stodgy foods such as suet and other puddings and an excess of potatoes. The patient should take small meals and should not drink much fluid with the meal. It is a curious thing that hydrochloric acid seems to benefit many cases of rosacea even when there is an adequate amount of acid in the stomach, as shown by the test-meal. Possibly it improves the tone of the stomach and it is well worth trying hydrochloric acid in any case of rosacea. In addition to acid, which should be taken in water with meals, a stomachic mixture containing soda bicarbonate and rhubarb should be drunk half an hour before meals.

EFFECT OF VITAMINS

One last word about vitamins—what effect have they on the skin? Marked deficiency of certain of them produce well-known conditions such as pellagra with its erythematous and pigmentary changes and purpura in scurvy. But apart from these well-defined syndromes, other changes are attributed rightly or wrongly to hypovitaminosis. Lack of vitamin A causes xerophthalmia, but also a roughening and dryness of the skin due to a follicular hyperkeratosis. These changes have been observed in an extreme degree in China where there is gross undernutrition, and less severe cases have been recorded in this country. Further Mackay (1934) has investigated a group of poorer class babies fed on their normal diet and compared them with babies fed on the same diet together with a supplementary dose of vitamin A. The incidence of napkin dermatitis, intertrigo, &c., was very much higher in those children who did not receive the extra vitamin A; this suggests that the average poorer class baby may be suffering from some degree of vitamin-A deficiency, which makes its skin more susceptible to irritation. Lack of vitamin B is of course associated with pellagra, which I cannot discuss here. Vitamin B is found in large quantities in yeast and this has a reputation for curing boils. I have never been able to satisfy myself that it does much good.

The skin is remarkably rich in vitamin C, which seems to play an important rôle in its nutrition. Gross lack of this vitamin produces purpura, but a lesser degree of deficiency can also have effects on the skin and can lead to a dryness and a follicular hyperkeratosis which makes the skin feel like a nutmeg-grater. It is possible that many infants are suffering from some degree of vitamin-C deficiency which makes them more susceptible to skin affections. I think it is important, therefore, from the dermatological point of view, that all infants should receive adequate amounts of fruit juice. Vitamin D is produced by the action of sunlight on the skin and is supposed to aid the cutaneous defences.

It is easy to determine the effects of gross deficiencies of vitamins but I am sure that we do not yet know all the influences that vitamins have on the skin. It is

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possible that abnormal states, such for example as seborrhœic eczema, may be favoured by or associated with an insufficient supply of vitamins. In the small series of cases of seborrhœa which I have so far investigated by the dark adaptation test for vitamin A, this has been deficient in a striking proportion of patients. In some instances the failure may be in the absorption from the gut rather than in the diet, so that on an apparently adequate intake the patient may still not get enough vitamins. Without therefore knowing all the exact actions of vitamins, it is probably a sound thing to give patients suffering from skin diseases plenty of them.

CONCLUSION

I have confined myself chiefly to diets together with a few drugs which act in conjunction with these diets. There are of course other drugs that have an action on the skin, but I will not deal with these beyond saying that the most useful drugs in dermatology are sedatives such as bromides and luminal, which should always be given in adequate doses. I have not mentioned local treatment nor the important psychological aspect of dermatology, but have merely attempted to outline one side of the treatment of skin diseases which cannot be neglected if we are to deal with our cases properly.

I would like to acknowledge the debt that I owe to the teaching of Dr. H. W. Barber of Guy's Hospital while I was working in his department.

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THE LANCET 100 YEARS AGO

May 5th, 1838, *p.* 177.

From a lecture on medicine delivered at the Theatre of Anatomy and Medicine, Webb-street, Southwark, by Dr. Marshall Hall, F.R.S.

GENTLEMEN:—My last lecture has given you a good idea of the treatment which you are to expect if any of you should make a decided improvement in our profession. Such an event will not, at the first at least, add to your happiness; it will, on the contrary, raise up a host of detractors,—reviewers, and the editors of reviews and journals, &c., who will not hesitate to insinuate, nay, even to assert, the most unfounded charges. Be not disconcerted, however, at these things; pursue the path of investigation, and of truth and honour, and these vipers will find at last, in your case, as in mine, that they do but bite against a file.

ANOREXIA NERVOSA

WITH SPECIAL REFERENCE TO THE CARBOHYDRATE METABOLISM

BY C. WALLACE ROSS, M.B. Melb.

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THE essential clinical facts of anorexia nervosa were clearly expressed in the terms of his period by the first English writer on the subject, Richard Morton (1694). In the chapter "Of a nervous consumption" in his Phthisiologia one may find the following passages:—

"... the Pathognomonic Signs ... are a decrease of the Patient's Strength, and a loss of Appetite, without any remarkable Fever, Cough, or shortness of Breath, though in the progress of the Distemper there is some difficulty and trouble in breathing to be observed, as it uses to happen to all those who are under a great Weakness....

"The immediate cause of this distemper I apprehend to be in the System of the Nerves, proceeding from a Preternatural state of the Animal Spirits, and the destruction of the Tone of the nerves; whereupon I have used to call this a consumption in the Habit of the Body. For as the Appetite and Concoction are overthrown by the weak and infirm tone of the Stomack, so also the Assimilation, the Fermentation, and Volatilization of the Nutritious Juice are hindred in the whole Habit of the Body from the distemper'd state of the Brain and Nerves.

"The Causes which dispose the patient to this disease, I have for the most part observed to be violent Passions of the Mind, the intemperate drinking of Spirituous Liquors, and an unwholesome Air, by which it is no wonder if the Tone of the Nerves and the Temper of the Spirits, are destroy'd."

Although there has been no significant challenge to this psychogenic view of the disorder, there have been various suggestions of a pituitary element. The purpose of the present paper is to point out that the abnormalities of carbohydrate metabolism, on which some of these suggestions are based, are in fact those of inanition, and can be rendered normal by giving a satisfactory diet or by the administration of certain liver preparations.

CASE-HISTORY

A girl aged 12 was admitted to hospital on April 7th, 1937, under Dr. A. V. Neale, with the history that she had lost her appetite apparently because of worry resulting from seeing her grandmother "in a seizure" (due to cerebral thrombosis) some six months previously. She had of late found her schoolwork difficult and oppressive, and was often in tears. Her food intake had almost ceased. She complained that if she ate anything she at once felt sick, and in fact often vomited when persuaded to eat a little.

She is by eleven years the youngest in a family of eight. Two others died of infectious disease in early childhood, but the remaining five were all mentally and physically sound, and married. The home is quite normally constituted, though the parents are rather over-solicitous, and the environment is of a peculiarly depressing industrial character.

On admission she was grossly emaciated, weighing only 48 lb. but no organic abnormality was found. The skin had a strikingly waxy appearance. She was tearful, desperately anxious in expression, and would speak only in a whisper, and that reluctantly.

* Working at the Children's Hospital, Birmingham. The expenses of this work are defrayed from a grant made by the Medical Research Council.

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Appetite was quite absent, and was not improved by giving Ryzamin, 2 grammes daily (equivalent to 100 international units of vitamin B_1) for ten days. After five weeks, further treatment was refused, and she was taken home unimproved. On August 6th, having been seen by an outside consultant who apparently diagnosed a hopeless endocrine failure, she was readmitted under the care of Prof. K. D. Wilkinson. The condition had greatly deteriorated and she now weighed only 39 lb. There were, paronychial infections and a gross autophytic dermatitis of both thumbs and indices resulting from incessant nervous movements of the one upon the other. Fig. 1A depicts her distressing condition at this time. She was desperately home-sick and the successful handling of the case called for the highest qualities in the nursing staff concerned.

Treatment.—During the ensuing few weeks, while the food intake remained minimal, an investigation of the carbohydrate metabolism was undertaken. This included oral and intravenous glucose-tolerance curves and insulin depression curves carried out both in the natural state and after the administration of liver preparations. The curves obtained are detailed in Figs. 4, 5, and 6 and explained in the discussion which follows. In a word, it will be seen that the original condition showed impaired glucose tolerance and insulin sensitivity, which was restored to, or towards, normal when liver extract (Campolon) was administered. Liquid extract of liver was then given, 1 fl. oz. by mouth daily for fourteen days, the diet being held constant although the appetite improved. It will be seen on consulting the weight chart (Fig. 2) that there was no gain during this period. Three ounces of malted milk powder (chosen for its high carbohydrate content and ease of administration) were now added to the daily diet, and a gain of weight at the rate of approximately 1 per cent. per day was immediately apparent. After an observation period the food was left uncontrolled, and a greatly increased mixed diet was taken with avidity. A final intravenous glucose-tolerance test done after twenty days on full and free diet was normal, and the liver was discontinued.

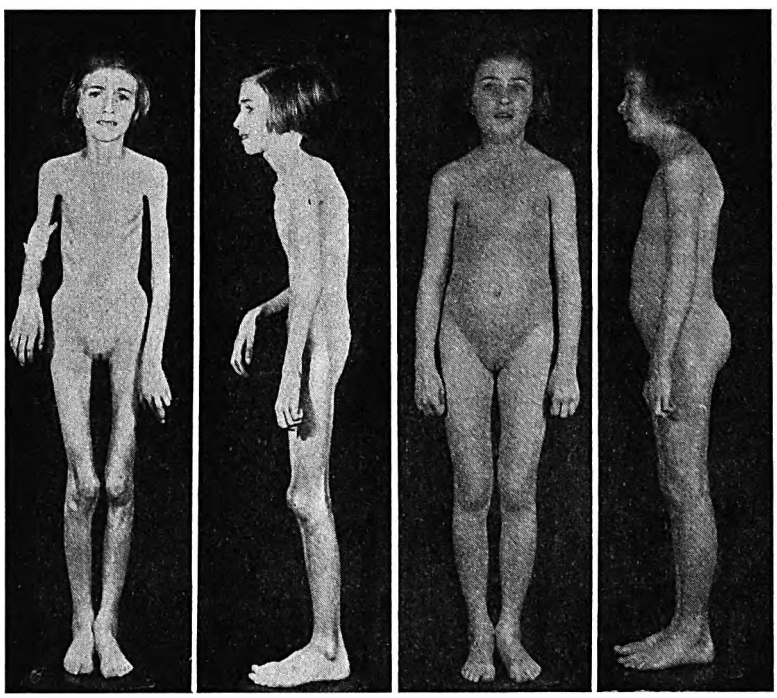

FIG. 1.—The patient aged 12. (A) Before treatment (weight 40 lb.). (B) After 53 days' treatment (67 lb.).

Progress.—During this period of weight gain there was a most gratifying change in the child's demeanour. Though still extremely reticent, she now strolled about the ward and made friends with some of the other children, and was even seen to laugh with them. Accidental discovery of the fact that she was to be transferred to a convalescent hospital, however, worried her very much, and in two days she lost 2 lb. Realisation proved more pleasant than anticipation, and in her new environment the gain of weight was resumed so that in fifty-three days from the increase of diet she had gained 27 lb. on an original weight of 40 lb.—about 1¼ per cent. per day. At this time she was not easily recognisable, as a comparison of the photographs in Fig. 1 will show. The patient has recently been seen again, after three months at home. She now weighs 74 lb. (Crozer Griffiths' normal for her age is about 79 lb.) and is in perfectly normal health. She is a little shy, but quite devoid of abnormal mental signs.

THE ENDOCRINE VIEW

The essential features of this case seem to be the close resemblance of the changes found in glucose tolerance and insulin sensitivity to those produced by starvation or carbohydrate deprivation in normal subjects, and the restoration of virtual normality when adequate food was taken. These two facts alone—that the whole condition can be closely simulated by starvation, both clinically and biochemically, and that complete cure can be produced by attention to nutrition—seem sufficient to dispose of any necessity to invoke an endocrine machinery. Nevertheless, it will be of interest to consider some of the reasons that have been adduced for suspecting an endocrine disturbance.

Amenorrhœa has given rise to a great deal of discussion, for it is a common and important feature of the condition. We have no observations to offer in this case, since the menses were not established. Ryle (1935) regards the amenorrhœa as a "parallel" symptom. Since it may certainly antedate the anorexia, and since amenorrhœa is not uncommonly seen in severe emotional and mental disorders, there seems no reason to question this. Again, Sheldon (1937) quotes from Cornish (1879) a clear description of this symptom in Indian famine conditions. In all probability, therefore, amenorrhœa can arise either directly or as a consequence of wasting, independently of any special endocrine disorder.

Attempts at slimming, particularly by plump or obese adolescents, provide a fairly common cause of anorexia nervosa. It has of course been suggested that the very plumpness of these cases is possibly of pituitary origin. Even if this be so, the pituitary is hardly implicated as a cause of anorexia. As I shall later emphasise, starvation itself commonly leads to anorexia. Certain workers on obesity have

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even commented to me upon the rather morbid disposition of many of these patients, which they incline to regard as an evidence of endocrine disorder. Such an interpretation seems hardly justified, for no one who has tried for a period the diets commonly used for slimming will doubt the provocation these patients are under.

Hirsuties, or an "overgrowth of downy hair on the trunk and limbs" are considered by Ryle (1937) to be important stigmata in some cases, though he by no means endorses any assumption that such cases are of pituitary origin. Of eight cases of which I have taken note, only one showed this sign. This was a case of pituitary basophilism, in which the anorexia clearly followed upon prolonged worry because of incapacity to work, this being due to severe headache. One wonders whether in other hirsute cases some endocrine disorder may not have led to Morton's "distemper'd state of the brain and nerves," and so to anorexia.

Depressed basal metabolism is a common feature of these cases. It has been regarded as difficult of explanation (Sheldon 1937) because of the reckless expenditure of energy to be observed in some cases. I have not been able to discover, however, that such a disposition has ever been found actually coupled with a lowered basal metabolism. Those cases known to me in which the metabolism has been estimated and found low have all been of a markedly indolent type, at least so far as concerns physical activity.

Disturbances of carbohydrate metabolism have received a good deal of attention. Unfortunately the methods employed have not always been beyond cavil. Sheldon (1937) reported three cases in which oral glucose-tolerance curves were done. In two of these, early curves were of a flat type while later ones were high and failed to fall in standard time; the third was initially high. On this evidence, together with certain physical signs, he based a conception of the cause of anorexia nervosa as a "functional Simmonds's disease—a pituitary 'black out' of psychological origin." More recently (1938) he has considered that such an endocrine view is not necessary to explain the glucose-tolerance curves, the peculiarities of these being of dietary origin. While agreeing entirely with this last conclusion, it is necessary to take exception to the curves upon which it is founded. As I have already stated in a letter (Ross 1938), a good deal of work on children has convinced me that oral glucose-tolerance curves are subject to two variable factors so important as to render them useless except as sidelights upon intravenous curves—namely, the rate of passage of the test-dose from the stomach into the intestine, and the rate of absorption of sugar from the intestine. The errors introduced by the latter are well illustrated in cœliac disease, some cases of abdominal tuberculosis, and chronic intestinal indigestion (Ross 1936a, b, and c). The variability of the former in conditions of debility is suggested by the curves shown in Fig. 3, all of which were derived from the same patient—a case of very chronic cardiac failure—within a week, the clinical condition being quite unaltered. It is probable that the flat oral curves recorded in anorexia nervosa and in many other conditions should be disregarded. The true state of tolerance is rather reflected in the high curves obtained when occasionally the stomach empties normally.

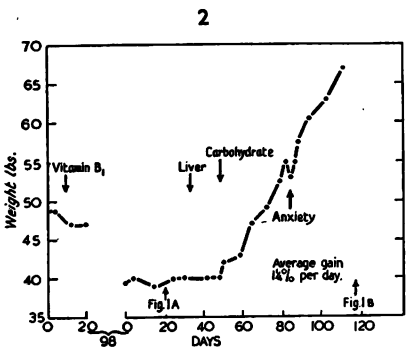

FIG. 2.—Weight chart, covering both periods in hospital.

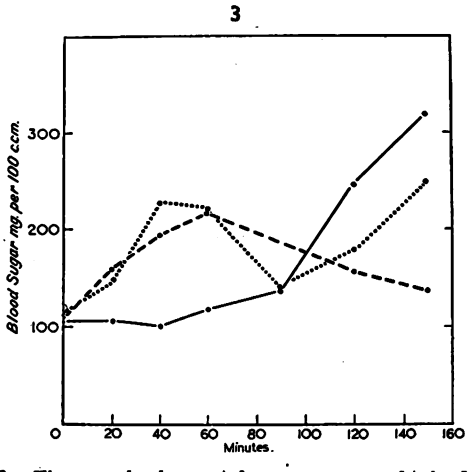

FIG. 3.—Three oral glucose-tolerance curves obtained from a case of chronic cardiac failure in the course of a week, showing variability of the results. The clinical condition was unaltered.

Intravenous curves of course avoid both of these sources of error, and give very satisfactory results provided they are carried out under carefully controlled conditions. Sheldon (1938) did such a curve on his case, but unfortunately used as a control a curve—obtained from a "surgical convalescent"—which was by no means normal, so being led to deem the tolerance in his case supernormal, whereas it is in fact definitely impaired, as is usual in such cases.

The intravenous curves in the case here reported are shown in Fig. 4. The line representing the patient's natural state is of the "humped" type—showing a change in the rate of removal of sugar from the blood—often seen in fairly acute carbohydrate deprivation. The corresponding oral curve is the solid line in Fig. 5, while the relative insensitivity to insulin (Himsworth 1935) is shown by the solid curve in Fig. 6. This last should be compared with the curves, in Fig. 7, obtained from a normal subject when on a normal diet and after withholding carbohydrate. From the point of view, then, of glucose tolerance and insulin sensitivity, the case closely resembles simple inanition.

Following upon the work already done in the inanition consequent upon defective absorption (Ross 1936a, b) the effect of liver preparations on this state of impaired glucose tolerance and insulin sensitivity was investigated. The tests already detailed were all repeated, firstly after an immediately preceding intravenous injection of campolon, and again after prolonged oral administration of liquid extract of liver. It will be seen by reference to Figs. 4, 5, and 6 that there was in each either a restoration of normality or an approach thereto, as I had previously found in other conditions.

Finally, the intravenous glucose-tolerance test was repeated when the patient had taken a normal diet for twenty days. It was again normal.

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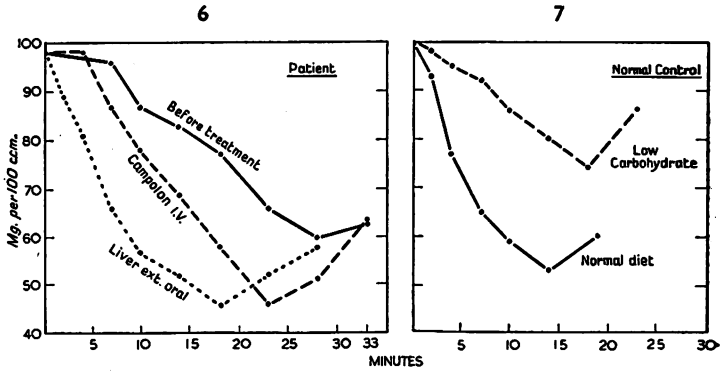
THE BASIS OF ANOREXIA

Recognition that the metabolic abnormalities found in anorexia nervosa are due to inanition and are abolished by proper nutrition, leads naturally to a consideration of the mechanism by which these same abnormalities lead to a continued anorexia, physiological rather than nervous. The normal desire for food appears to comprise two distinct and perhaps equally important sensations—hunger, which "is unpleasant, an emptiness or craving resulting from an undue abstention from food, at times akin to nausea, and at times even a painful sensation," and appetite, which is "a desire or readiness for food . . . customarily regarded as a pleasant sensation" (Ryle 1935), and based to a considerable extent on the memory of previous pleasurable experience. While appetite is thus largely a psychological matter, hunger is more truly physical, although subject to mental interference, as for instance by disgust arising from a revolting sight or odour. Its precise mechanism is not wholly clear; but a good deal can be said with confidence. Cannon and Washburn (1912) showed by direct experiment that the belief expressed by Weber (1846) was substantially correct—that "strong contraction of the muscle-fibres of the wholly empty stomach, whereby its cavity disappears, makes a part of the sensation which we call hunger." It was further shown that after a few days of fasting, hunger contractions cease—a fact in keeping with the widely reported experiences of hunger-strikers, and others of equally sturdy resolution. Further, although I have characterised appetite as being largely a psychological matter, it is a subject of common observation by radiologists that a poor appetite is very often accompanied by low gastric tonus. In 1924 Carlson and Bulatao, and Dickson and Wilson showed that the hunger-pains accompanying the fall of blood-sugar brought about by injecting insulin are accompanied by gastric contractions of the normal type. The latter workers found a blood-sugar value of 70 mg. per 100 c.cm. at a time when hunger was really acute. In my own series of administrations of insulin to children, about three-quarters have complained of severe hunger when the blood-sugar level was from 84 to 66 mg. per 100 c.cm. Quigley, Johnson, and Solomon (1929) repeating similar work to that of Carlson, found that the gastric hyperactivity following upon the administration of 10–12 units of insulin was effectively stilled by giving glucose, but not by giving carbohydrate-free foods.



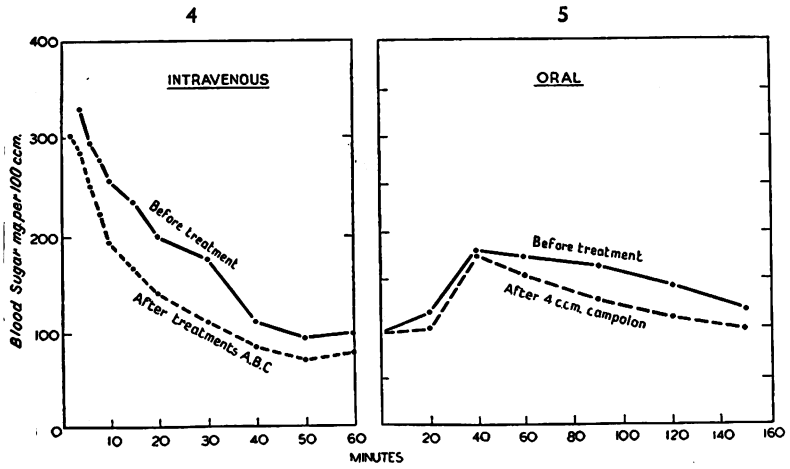
INSULIN DEPRESSION CURVES (4 units intravenously)

FIG. 6.—The patient's natural state: after intravenous campolon (3 c.cm.); and after 12 days on an oral liver extract.

FIG. 7.—A comparable normal subject.

It seems clear, then, that there is a relationship, be it causal or coincident, between the gastric manifestations of hunger and a fall in the blood-sugar level, and it would be strange if it were merely coincident. If it is causal, then a reasonably rapid fall of alimentary hyperglycæmia back to the fasting level is necessary for the regular recurrence of hunger; and this fall we know is dependent upon a reasonably good glucose tolerance. Partial starvation at once leads to impaired glucose tolerance, so that meagre and inadequate meals lead to prolonged periods of satiety. If for any reason, then—be it psychological, emotional, or physical—a patient refrains from taking sufficient food, particularly carbohydrate, it is not surprising that hunger should fail after a few days. This conception seems applicable to a number of conditions other than anorexia nervosa. The anorexia of early convalescence, the indifference to food often seen in undernourished babies or those which by diarrhœa and vomiting have suffered acute starvation, may all be susceptible of a similar explanation. Perhaps, too, it is a link in the chain of events that explains the "difficult feeder" among children. Certainly in various absorptive diseases the exhibition of liver and the restoration thereby of normal glucose tolerance has often been observed to revive appetite and the sense of well-being in a remarkable manner.

It was upon such reasoning that liver extract was used, in the case reported, to restore hunger. As shown in the various curves, it had a definite effect in improving glucose tolerance and insulin sensitivity, whether or not the view



GLUCOSE-TOLERANCE CURVES

FIG. 4.—Intravenous (10 g. of glucose in 20 per cent. solution in normal saline given in one minute). The lower curve, which is normal, was obtained on three occasions: (*a*) after 4 c.cm. of campolon intravenously; (*b*) after liver extract by mouth for 14 days; (*c*) when diet had been normal for 20 days.

FIG. 5.—Oral (30 g. in 20 per cent. solution in water). Before and after intravenous campolon.

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that it contains the "insulinkinase" principle, hypothesised by Himsworth (1933) is found to be correct. The accompanying return of hunger, very closely followed by appetite, was striking. In no sense, however, should this treatment suggest a lack of appreciation of the need for management of the patient. The return to such a state of mental and physical health as will enable the sufferer to face the rigours that led to morbidity must remain the crown of skilful physicianship and devoted but tactful nursing.

CONCLUSION

The conception of anorexia nervosa put forward is that, psychological reasons having led to a brief abstinence from food, the physiological factor of impaired glucose tolerance, with a slowly falling alimentary hyperglycæmia, leads to failure of hunger and the impairment of one element of appetite—a normal gastric tonicity. Even, in some cases of drastic slimming, underfeeding may lead to both mental depression and failure of hunger. Hunger can be largely restored by the use of liver extract, and maintained by the choice of a high carbohydrate diet most readily given in a fluid form such as malted milk; while correction of the attitude of the patient calls for psychological management. As soon as a full diet is reached, physical normality is not far ahead.

SUMMARY

1. Passages from the first English description of anorexia nervosa are quoted.

2. A successfully treated case in a girl of 12 years is reported, with investigations of the carbohydrate metabolism.

3. The evidence adduced for a pituitary disturbance is reviewed. This belief is not favoured, but a purely dietetic basis for the physical and chemical findings is preferred.

4. The relation of inanition to "physiological" anorexia is discussed.

I wish to thank Prof. K. D. Wilkinson and Dr. A. V. Neale for permitting me to work upon and report this case; Miss E. L. Tonks, M.Sc., for making the blood-sugar estimations by a special micro-method; and Prof. L. G. Parsons and Dr. E. M. Hickmans for their help and encouragement.

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HOSPITAL DAY.—This year the London hospitals are once more combining to hold joint street collections. Hospital Day for the general hospitals will be on May 10th for inner London and on May 14th for outer London, while the special hospitals will make a separate appeal on Oct. 11th. Suggestions and offers of help should be sent to Lord Luke at the headquarters of the central committee, 36, Kingsway, London, W.C.2.

PERIPHERAL NEURITIS ASSOCIATED WITH PYLORIC STENOSIS AND DEFICIENCY OF VITAMIN B_1

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THE development of peripheral neuritis in the presence of gastro-intestinal lesions, benign or malignant, is well established. At the beginning of this century there were French accounts of polyneuritis after carcinoma or ulcer of the stomach—e.g., Duvernay (1907). At that time it was supposed that pyloric stenosis caused the retained food to ferment with the production of toxic substances, but more recently various authors have suggested that vomiting, anorexia, or achlorhydria may produce a deficiency of vitamin B_1 which causes the neuritis.

Wechsler (1933) describes a patient upon whom a subtotal gastrectomy had been performed for carcinoma of the stomach, and who developed three weeks later vomiting and polyneuritis; the latter was improved by a diet rich in vitamins. Perkins (1936) describes five patients with multiple neuritis associated with malignancy of the stomach; each had achlorhydria and anorexia, but only one vomited. He suggested that the neuritis was due to avitaminosis produced by "faulty intake and undoubted disturbance of assimilation or storage". Marinesco and others (1936) report polyneuritis following gastric ulcer with pyloric stenosis. The condition improved after partial gastrectomy and gastro-jejunostomy had been performed, but the polyneuritis persisted until injections of liver extract and the administration of drugs were started. Douthwaite (1936), on the basis of seven cases of severe polyneuritis associated with gastric disturbance, feels "justified in postulating the possibility of the existence of a gastrogenous polyneuritis"; the earlier reports, to which he did not refer, had already clearly demonstrated this association.

It is not our intention to review the extensive accounts that prove that disorders of the gastro-intestinal tract can cause hypovitaminosis. It should be recalled, however, that many authors have described pellagra following carcinoma of the stomach (Rolph 1916, Eusterman and O'Leary 1931), and Petri and his colleagues (1937) have shown that deficiency of a factor normally present in the gastric mucosa can cause pellagra (see also Sydenstricker and Thomas 1937). The case described by Marinesco and others had an abnormally small amount of vitamin C in the cerebro-spinal fluid when the polyneuritis was present, and the amount increased when the polyneuritis improved with treatment. Urmy and others (1934) described a case of beri-beri caused by short-circuiting most of the small intestine; Kohn (1910), Wechsler (1933), and other workers have reported similar symptoms after gastro-enterostomy. Many workers have shown that "alcoholic" polyneuritis and polyneuritis of pregnancy, and perhaps some other forms, are probably due to a deficiency of vitamin B_1 (Jolliffe and Colbert 1936, Strauss and McDonald 1933). More recently Harris, Leong, and Ungley (1938) have estimated the urinary vitamin B_1 under normal and pathological conditions, and have found that the excretion is lowest in "polyneuritis of nutritional origin." In a group of 6 such patients the excretion was as low as that found

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in cases of beri-beri under treatment, and the resting level of excretion was about a tenth of the normal. Low values were also found in 3 out of 8 cases which, on *clinical grounds* (their italics), had been considered to be non-nutritional. Further, in their cases of "nutritional polyneuritis" the excretory response to a test dose of vitamin B_1 was negligible in five and grossly subnormal in the remaining patient.

CASE REPORT

The following case of peripheral neuritis associated with pyloric stenosis seems to us to be of unusual interest because of the clear association of the symptoms with deficiency of vitamin B_1.

A night baker, aged 32, was seen on May 27th, 1936, complaining of attacks of vomiting, numbness and aching pain in the calves, and loss of power in the legs. In August, 1935, he had been operated on for a perforated pyloric ulcer, and the perforation closed with stitches. He subsequently enjoyed good health until March, 1936, when he began to vomit immediately after meals. These attacks occurred about once a week at first, but rapidly increased in frequency until May, 1936, when he was vomiting small amounts frequently every day. After a few weeks he noticed numbness of his calves and tingling in his fingers and toes. His calves also ached slightly. Soon afterwards he suffered from weakness of the legs. Previously a very moderate drinker, he had given up alcohol since his operation for a perforated gastric ulcer in August, 1935.

Examination.—When he was first examined on May 27th, 1936, walking was evidently difficult. He showed signs of recent loss of weight, the skin over the abdomen being wrinkled and inelastic. The urine contained a considerable amount of albumin. The cranial nerves were normal; the arms had normal power and no sensory changes; the arm-jerks on the left side were, however, impaired in comparison with those of the right arm. The right knee-jerk could only be elicited with reinforcement, while the left knee-jerk and both ankle-jerks were absent. The plantar responses were flexor. There was slight patchy impairment to pin-prick on the dorsum of the feet, but there was no definite loss of any type of sensation. He had slight aching pain in the calves and thighs and the muscles were tender on pressure, but pain and tenderness were never conspicuous throughout the course of the illness. The appetite had been very poor since the onset of vomiting. The tongue was normal in appearance. The cardiovascular system showed no abnormality, apart from a slight tachycardia of 90 to 100 which persisted with rest in bed. The electrocardiogram was normal in every respect, and there were no clinical signs of cardiac enlargement. A diagnosis of peripheral neuritis of uncertain ætiology was made, and the patient was admitted on June 1st for further investigation under the care of Dr. J. Burnford.

The condition on admission was substantially the same as at the previous examination as an out-patient five days earlier, except that the weakness of the legs had increased, the arm-jerks were now all sluggish, and the knee- and ankle-jerks could not be obtained, even with reinforcement.

Special investigations.—Only a faint trace of albumin was found in the urine, and this disappeared rapidly within two days of admission. The blood-urea was 48 mg. per 100 ml. on June 1st, but had fallen to 36 mg. by June 5th. The blood Wassermann was negative. In the cerebro-spinal fluid it was also negative and there was no increase of cells; analysis gave the following results:—

Total protein	30 mg. per 100 ml.
Globulin	Very slight trace.
Sugar	90 mg. per 100 ml.
Chloride	725 " " "
Colloidal gold curve	0112110000

The blood count was as follows:—

Red cells ..	4,550,000	Polymorphs ..	60·5 %
Hæmoglobin ..	82 %	Monocytes ..	7 %
Colour-index ..	0·91	Lymphocytes ..	31 %
White cells ..	6,900	Plasma cells ..	0·5 %
		Eosinophils	None seen

There was no polychromasia and no punctate basophilia.

Treatment and progress.—Vomiting ceased the day after admission. From June 8th to August 7th Benerva (Roche) 1 ml. intramuscularly—i.e., 1 mg. vitamin B_1—was given every other day. There was an immediate return of appetite after the first injection. The weakness of the legs, the paræsthesiæ, and the aching in the calves, which had increased up till June 12th or 13th, showed definite improvement from June 20th. By June 23rd paræsthesiæ and numbness had completely disappeared. On July 14th he was walking better than on admission. On August 10th he was discharged free from sensory symptoms, but with absence of reflexes and some weakness in the lower limbs.

READMISSION

In September, 1936, he was very much stronger and returned to work. He took Bemax, one teaspoonful daily, and kept quite well until early December, 1936, when he experienced pain across the epigastrium and nausea followed by occasional vomiting of large amounts. This led to a restriction of his diet to milk, milk foods, and bemax. After a week he noticed numbness and tingling in the fingers. By Jan. 6th, 1937, his legs were very much weaker. A fractional test-meal showed achlorhydria, even after a subcutaneous injection of 0·25 mg. histamine.

On Jan. 26th, 1937, he was admitted to hospital for the second time. Soon after his admission it was noticed that his stomach was distended, and gastric peristalsis was clearly visible. A barium meal was done and showed almost complete pyloric stenosis. On the 28th the apparent vitamin B_1 in the blood was estimated, and found to be 4 μg. per 100 ml.

Operation.—On Feb. 22nd laparotomy was carried out by Mr. Harvey Jackson. A large hard mass was found at the pyloric end of the stomach. Hard glands were felt in the mesentery. Posterior gastro-jejunostomy was performed, as it was felt that the patient was not fit to undergo gastrectomy. On March 25th Mr. Harvey Jackson carried out a partial gastrectomy. The following report was given by Dr. R. G. Waller on the specimen removed at the operation: "The pyloric wall is greatly thickened and is infiltrated with spheroidal carcinoma cells. Infiltration includes the muscular coat. A gland in the vicinity shows chronic inflammatory changes, but there is no evidence of secondary deposit."

Result.—The recovery from the operation was uneventful, and he was discharged three weeks later, on April 15th. On June 16th he was examined again as an out-patient. He felt well and had no gastric symptoms. He had been taking a milk diet, and still complained of some tingling in his fingers and toes, although there was a great improvement in this respect. The power of his legs had returned to normal. His arm-jerks were sluggish and the left supinator jerk could not be elicited. His right knee-jerk was very feeble, while his left knee-jerk and both ankle-jerks were absent. He was advised to take Marmite, 2 drachms daily, and to return to a full diet, including meat. He made a gradual improvement and returned to work about July 1st. He was seen for the last time on Jan. 19th, 1938, when he was feeling well, eating a full diet without digestive symptoms, except for a slight sensation of fullness after a heavy meal. He still takes marmite, 8 oz. per week. He had no sensory disturbance and the power of his limbs was quite normal. All the tendon reflexes were easily obtained. A sample of blood was taken for estimation of the apparent vitamin B_1; this was found to be 10 μg. per 100 ml.

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The apparent amount of vitamin B_1 in the blood was estimated on each occasion by the method described by Meiklejohn (1937), but slightly modified (Sinclair 1938). This method is an adaptation of Schopfer's test and involves growing a fungus *Phycomyces blakesleeanus* upon a medium to which the blood is added. A value below 7 µg. per 100 ml. is regarded as being abnormal, and, out of about 200 determinations made by one of us (H. M. S.) on normal and pathological samples of blood, the first (4 µg. per 100 ml.) is the lowest value that has been encountered. The second determination gave a normal figure.

DISCUSSION

It will be noticed that after the onset of vomiting the patient developed polyneuritis, and that this was cured by injections of vitamin B_1. After the injections ceased he took a preparation containing the vitamin by mouth, but vomiting began again and the polyneuritis returned, although the vitamin B_1 was still being taken orally. At this time the apparent concentration of vitamin B_1 in the blood was very low. After gastro-jejunostomy and partial gastrectomy and the oral administration of a preparation of vitamin B_1, the polyneuritis disappeared unusually completely, and the apparent vitamin B_1 in the blood returned to normal. It is also interesting to note that recovery from the first attack of neuritis, during which he was receiving the vitamin parenterally, was more rapid than that from the second attack when oral treatment alone was employed. These facts strongly suggest that deficiency of vitamin B_1 caused the polyneuritis. Peters (1936) has proved that deficiency of vitamin B_1 in animals produces a disorder in the oxidation of carbohydrate in nerve-cells, and has correlated this biochemical lesion with the symptoms. Meiklejohn (1937) found that in "avian polyneuritis" the amount of vitamin B_1 in the blood was low.

If we are correct in attributing the polyneuritis to deficiency of vitamin B_1, two main possibilities arise: either the vomiting caused a deficient intake of the vitamin, or some factor produced by the stomach or duodenum destroyed or prevented the absorption of the vitamin. It seems unlikely that the former can be the cause of such cases because in Douthwaite's two patients with carcinoma of the stomach the vomiting started "some weeks" after the onset of the polyneuritis, and only one of Perkins's five patients vomited. Nevertheless, the latter possibility is not easily explained. It is well known that vitamin B_1 is unstable in an alkaline medium, and almost all cases of deficiency of the vitamin are accompanied by achlorhydria. It is possible that an enzyme produced by the stomach or duodenum destroys the vitamin in the prolonged presence of alkali; there is as yet no evidence for such a possibility and some evidence against it. It is also possible that the vitamin must be phosphorylated before being absorbed in the intestine, since it may act in the body as the diphosphate (Lohmann and Schuster 1937); a factor from the stomach or duodenum might prevent this phosphorylation in an alkaline medium. Yet most patients with achlorhydria do not develop polyneuritis. Work is now in progress to decide these points.

SUMMARY

1. A case of carcinoma of the stomach causing pyloric stenosis and accompanied by peripheral neuritis is described.

2. Estimations of the apparent vitamin B_1 in the blood, and the response to therapy with the vitamin, strongly suggest that the neuritis was caused by a deficiency of the vitamin.

3. The possible bearing of these findings on the cause of the vitamin deficiency is discussed.

We wish to thank Dr. J. Burnford and Mr. Harvey Jackson for permission to investigate this case.

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TREATMENT OF BUBO WITH SULPHANILAMIDE

BY ALEXANDER HUTCHISON, M.B., F.R.F.P.S. Glasg., D.P.H.

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THE cure of bubo, with or without a concomitant active chancroid, is slow and often unsatisfactory. The duration of in-patient treatment is long and the results of many methods are poor.

In this series of 35 consecutive cases seen in the venereal diseases ward of Belvidere Hospital between January, 1935, and March, 1938, the first 12 were treated with local applications alone, the second 12 with Dmelcos vaccine, and the remaining 11 with Streptocide (sulphanilamide Evans). All the patients had a definite bubo, and some a chancroid on the penis. None suffered from gonorrhœa and all had a negative Wassermann reaction of the blood-serum.

Group 1 (*heat*).—All 12 cases were treated by local application of heat in the form of a kaolin poultice which was changed morning and evening, and an antiseptic dressing (eusol) to the sore when one was present. In 6 cases the bubo was on the right side, in 5 it was on the left, and in 1 there was a bilateral inguinal swelling. In 10 a chancroid was actually present, and in 2 there was a healed sore. Under treatment with heat and antiseptics incision for the removal of pus was required in 8 cases and aspiration (four times) in 2. In the remaining 2 the inflammation resolved without breakdown of the glands.

The average stay in hospital was 46·2 days, the maximum and minimum times being 76 and 17 days respectively.

Group 2 (*vaccine*).—The 12 patients in this group received Dmelcos vaccine intravenously commencing with 0·5 c.cm. and increasing by 0·5 c.cm. daily until the maximum dose of 3 c.cm. had been given. A eusol dressing was applied to the sore when one was present. In 4 cases the bubos were on the left side,

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in 4 they were on the right, and in 4 they were bilateral. Chancroids were present in 10 cases and scars of old sores in the other 2. Pus formed in 10 cases, and though they were at first treated by aspiration incision was eventually needed for all of them. The remaining two bubos resolved without forming pus. Some of the patients showed a severe reaction to the vaccine, running a high temperature (103° F.) for forty-eight hours and suffering from shock.

The average stay in hospital was 46·7 days, the maximum and minimum times being 117 and 22 days respectively.

Group 3 (*sulphanilamide*).—The last 11 patients were each given 1·0 gramme of sulphanilamide four-hourly, a eusol dressing being applied to the sore if present. The maximum amount of sulphanilamide given was 138 g. and the minimum 60 g. In 7 cases the bubo was on the left side, in 1 it was on the right, and in 3 there was a double inguinal bubo. Further, 7 patients had chancroids, and the remainder had scars of old sores. In 2 cases pus formed, but it was successfully removed by a single aspiration, incision never being needed. The remainder resolved without interference.

The average stay in hospital was 15·5 days, the maximum and minimum times being 23 and 10 days respectively.

One case of this series is worth recording. The patient had a chancroid measuring ¾ in. in diameter and a very painful and tender bubo measuring 4 by 2 in. in his left inguinal region. He received 90 g. of sulphanilamide in fifteen days. In four days the pain and tenderness had passed off. In nine days the chancroid had healed, and in fifteen days the last trace of the inguinal swelling had disappeared. Treatment was then stopped and he was kept under observation in hospital for ten days, but there was no recurrence of the bubo.

Intolerance to sulphanilamide arose in only 1 case. The patient, a Lascar seaman, after receiving 60 g. developed a temperature of 99·6° F. with cyanosis of the tongue. As his bubo was almost healed, the drug was stopped and he continued to improve and became cured.

The comparative results of the various methods of treatment may be summarised as follows :—

Method of treatment.	Cases.	Cured by aspiration.	Requiring incision.	Average stay in hospital (days).
Local applications ..	12	2	8	46·2
Vaccine	12	0	10	46·7
Sulphanilamide ..	11	2	0	15·5

All 35 cases were treated to a successful conclusion, and the most striking difference between the three groups is the reduction in the average duration of in-patient treatment from forty-six days to fifteen days. Among the 24 patients not receiving sulphanilamide, aspiration was necessary in 20 cases and incision in 18, whereas among the 11 treated with sulphanilamide aspiration was required in only 2 and incision in none.

All the groups were under the same general control and observation, and the longer stay of the earlier cases does not represent a longer period of observation before cure was held to be established.

Though the number of cases so far treated with sulphanilamide is small, the evidence is in favour of this drug in the treatment of bubo.

My thanks are due to Dr. Archibald, the medical superintendent of the Belvidere Hospital, for permission to publish these results, and to Mr. Simmons, the chief attendant of the ward, for his care in supervising the carrying out of the treatment.

HYPERTROPHIC PYLORIC STENOSIS IN ONE OF UNIOVULAR TWINS

BY WILFRID SHELDON, M.D., F.R.C.P. Lond.

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ALTHOUGH hypertrophic stenosis of the pylorus in infants is now a frequently recognised condition, and a very large number of cases are on record, little advance has been made in our knowledge of its pathogenesis since the original theories of a primary hypertrophy of muscle (Hirschsprung) and a primary neuromuscular incoördination (John Thomson) were propounded. The well-known fact that four-fifths of the cases occur in male infants suggests at once that the condition is sex-linked, or to some extent sex-limited, and has its roots in an inherited defect. There are now several records of the disease having involved more than one child in a family, a noteworthy example being the family reported by Fabricius and Vogt-Muller (1937), in which all four children of the same mother, three of whom had the same father and one a different father, were affected. The condition has been noted in a mother and child. Cockayne (1934) has recorded two pedigrees in each of which two infants who were first cousins suffered from the disease, and he states "there can be little doubt that the condition has a genetic basis, though the way in which it is inherited is still uncertain, and an environmental factor may be necessary for its production in addition to the genetic one."

TABLE GIVING RECORDED INSTANCES OF PYLORIC STENOSIS IN TWINS

Author.	Type of twins.	Clinical notes.
Moore (1934).	Uniovular.	Both males. Diagnosis confirmed in each by operation. Both died.
Davis (1924).	Not stated.	Both males. Diagnosis confirmed in each by operation. Both recovered.
Bilderback (1928).	Uniovular.	Both males. Diagnosis confirmed in each by operation. One recovered, the other died.
Redgate (1935).	"	Both males. Diagnosis confirmed in each by operation. One recovered, the other died.
Varden (1933).	"	Both males. Diagnosis confirmed in each by operation. One recovered, the other died.
Sommer (1931).	"	Both females. Diagnosis confirmed in each by operation. Both recovered.
De Lange (1936).	"	Both males. Diagnosis confirmed in each by operation. Both recovered. A maternal aunt had also had hypertrophic pyloric stenosis.
Cockayne and Sheldon (1928).	"	Both males. Diagnosis confirmed in each by operation. One recovered, the other died.
Lasch (1925).	Uniovular (one chorion).	Twin girls. One was normal, in the other gastric peristalsis was seen, but the infant died before operation. Post-mortem examination showed a hard and thickened pylorus.
Monrad (1927).	Not stated.	228 cases of pyloric stenosis with three sets of twins. One of each pair had the disease, the other was healthy.

A study of the disease in twins should throw further light on the presence of an inherited factor. There are published records of the disease in 10 sets of

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twins (see Table). Unfortunately the type of twins has not always been stated.

It may be pointed out that the occurrence of 3 sets of twins in a population of 228 infants (1 in 76) corresponds to the normal proportion of twin births, which is estimated at about 1 twin birth in every 80 births. Apart from Davis's and Monrad's cases, the twins were stated to be uniovular, and, with the exception of Lasch's twins, in each set both twins were affected. This would accord with the view of an inherited factor. As to Lasch's twins, only one of whom was thought to have pyloric stenosis, a pyloric tumour was not felt during life, and the description of the post-mortem appearance of the pylorus leaves one in some doubt whether the condition was in fact a hypertrophic stenosis. With the exception of Lasch's case, the evidence indicates that when pyloric stenosis affects uniovular twins, both infants show the condition.

In an attempt to obtain more information about the occurrence of the disease in twins, the clinical notes of 1000 cases of hypertrophic pyloric stenosis treated at the Hospital for Sick Children, Great Ormond-street, during the years 1912–36 have been analysed. In this large series there were no less than 23 sets of twins, and in passing it is worth noting that this is nearly twice the number of twins that one would have expected, allowing 1 twin birth for every 80 single births. In this population of 1000 infants with pyloric stenosis the proportion of twins to single births was 1 to 43·4.

As is so usual in conning hospital records, full details of the particular aspect under investigation were not always forthcoming. Evidence that the twins were uniovular was only found in one pair, and then the notes stated that there was one placenta, one chorion, and two amnions. Both twins were affected, and the diagnosis was confirmed in each at operation. (These twins appear in the Table, reported by Cockayne and Sheldon 1928.) In the remaining 22 sets of twins only one of each pair had the disease. In 12 of these pairs the twins were binovular; the evidence of this lay in the fact that in 11 of them the twins were of opposite sex, while in the twelfth case, although both twins were boys, their father, a medical practitioner, stated that they are quite unlike each other in appearance, physique, and mental outlook. There remained 10 sets of twins for whom uni- or bi-ovularity could not be decided—either the twins were of the same sex, or more often the sex of the healthy twin was not stated. The evidence from this analysis indicates that when pyloric stenosis affects binovular twins, the disease is likely to occur only in one twin.

CASE REPORT

The occurrence of pyloric stenosis in only one of uniovular twins is evidently so exceptional, and counter to what one would expect, that the following case-history seems worthy of record.

On March 3rd, 1937, twin boys were born to a mother who already had two healthy daughters. The twins were exactly alike and both at birth weighed 4 lb. During the next few weeks, however, their histories differed, for while one prospered, the other was reported to have vomited almost from birth, to have been constipated, and to have failed to gain weight. This infant was seen in consultation on May 3rd, at which time the weight was only 3 lb. 12 oz.

Examination.—Compared with his brother, who was steadily gaining weight, the patient was wretchedly emaciated, but even so there was a very noticeable similarity in the facial appearance of the twins. Examination of the patient while he was being given a feed showed the presence of vigorous gastric peristalsis, and on palpation the hypertrophied pylorus could be felt undergoing alternate contraction and relaxation. The twin brother was examined in the same way, but peristalsis could not be seen, nor could a pyloric tumour be felt.

Operation.—On the next day a Rammstedt operation was performed on the affected twin, a typical hard pyloric muscle tumour being found at operation.

Progress. — The after-history was uneventful. Following the operation the vomiting ceased and the infant gained weight steadily. When the twins were seen again two months later they were both thriving, the patient having caught up to within half a pound of his brother's weight. By that time the twins were so alike that the presence of the operation scar in the one was beginning to be a useful means of identification. At the time of writing the twins are a year old and remain exactly alike.

The identical appearance of the twins strongly pointed to their being uniovular. Further evidence of this was kindly furnished by Dr. Bishop of West Wickham, who attended the confinement, and has informed me that there was only one placenta without any line of fusion, and one set of membranes. The cords were separately inserted into the placenta. With the object of trying to prove still more fully the identical nature of the twins, when they were four months old their fingerprints were taken. To obtain good fingerprints at this age calls for a highly skilful technique, and I am deeply indebted to two officials, who have made a lifelong study of this subject, for taking the fingerprints and reporting on them. They warned me that even uniovular twins do not have identical fingerprints, and so it proved in this case, the expert report being that the finger- and thumb-prints of the twins were not facsimiles. The blood group of each twin has not been ascertained.

COMMENTS

It remains to discuss whether the unaffected twin can have had the condition in some form devoid of symptoms. Two instances of hypertrophic pyloric stenosis without symptoms have been recorded by Findlay (1937), but in both cases although symptoms were absent, the usual physical signs of gastric peristalsis and a palpable pyloric tumour were present, and enabled the diagnosis to be made. I have already mentioned that the healthy twin was examined at the time when the diagnosis was made in the affected one, and physical signs of the disease were not obtained. There is therefore no reason to suppose that the pylorus was in any way abnormal.

SUMMARY

An example of hypertrophic pyloric stenosis in one of uniovular twins is recorded. The published reports of the disease in twins are analysed. The results are given of an investigation into the incidence of twins among 1000 cases of pyloric stenosis.

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CLINICAL AND LABORATORY NOTES

ANALGESIA IN DENTISTRY BY MEANS OF NITROUS OXIDE AND AIR

By Rex Binning, M.R.C.S. Eng.

HON. ANÆSTHETIST TO THE ROYAL ALEXANDRA HOSPITAL FOR SICK CHILDREN, BRIGHTON; ANÆSTHETIST TO THE BRIGHTON AND HOVE DENTAL HOSPITAL

ANALGESIA produced by a mixture of nitrous oxide and air has been used increasingly in midwifery during the last four years and the majority of women attended in private practice now demand and receive its benefits. A similar principle has however been employed in dentistry since 1912, but has largely escaped notice.

The main scope for analgesia in dentistry is in the preparation of cavities for filling; it is unsuitable for the extirpation of nerves or for extractions. To quote Sedlin (1937), who has used analgesia in New York for many years, it may suitably be employed (1) for nervous and apprehensive patients; (2) for children; (3) for patients who have an idiosyncrasy to procaine. The first two divisions constitute the majority of patients met with in dental practice. Every day at a dental hospital and in private practice one sees teeth that have to be extracted because the patient feared the dental drill and so postponed a visit to the dentist until it was too late for conservative measures.

Method.—I have used both nitrous oxide and oxygen and nitrous oxide and air to obtain analgesia and have found nitrous oxide and air preferable in that the analgesic state it produces is less critical and does not require such a fine adjustment, no doubt because the inert nitrogen in the air acts as a diluent.

Before beginning, the patient's confidence must be obtained, for the operator must not attempt to give analgesia but rather to induce the patient to take it. The patient must understand that he is not having an anæsthetic and that he will not lose consciousness. A standard nasal inhaler is now adjusted over the patient's nose and it is essential to obtain an airtight fit. The expiratory valve is adjusted to a light tension. The patient is instructed to breathe through his nose and to take a deeper breath if he feels pain. The machine is set to deliver nitrous oxide at the lowest pressure that the patient can comfortably breathe through the nose, which corresponds in most cases to about 2 mm. of mercury. The adjustment of pressure is most important, for if the patient is breathing nitrous oxide under a positive pressure and air under atmospheric pressure the percentage of nitrous oxide delivered by the machine will obviously be completely upset. Success in securing analgesia depends more on the correct adjustment of pressure than on any other factor. The machine that I have used is the British Oxygen Company's model K. This machine delivers approximately 50 per cent. nitrous oxide in air when the mixing dial is set to the "normal" position, and this setting will usually be found suitable.

The subjective sensations of the patient to judge from several personal experiences are unobjectionable. The first is one of tingling that starts in the feet and spreads upwards over the whole body. This is followed by a pleasant feeling of warmth. Speech becomes thick but the mind is active and ideas come quickly. The dental drill can be heard but not felt. During this state the patient is very receptive to suggestion and a few soothing words spoken by the anæsthetist have a marked effect. There is no nausea or vomiting and the nasal inhaler can be so arranged that the patient can lean forward to expectorate without removing the hood from the nose.

The advantages of this technique are obvious. The patient is spared the very real pain associated with the preparation of a cavity, and at the same time avoids the initial prick and frequent after-pain of local anæsthesia. The dentist is able to work without interruption with a considerable saving of time.

The consumption of nitrous oxide by this method is 100 gallons for ten fillings and the cost about 7*d.* per filling.

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A CASE OF DISORDERED DEVELOPMENT OF THE FEMALE GENITALIA

By J. Orde Poynton, M.A., B.Chir. Camb.

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THE internal genitalia described below were removed at a post-mortem upon a Tamil woman of 28, alleged to have been murdered by her husband. Their outstanding feature was the presence of two separate masses of uterine tissue.

The vagina was rudimentary and was closed at the upper end, no cervix being present. The left

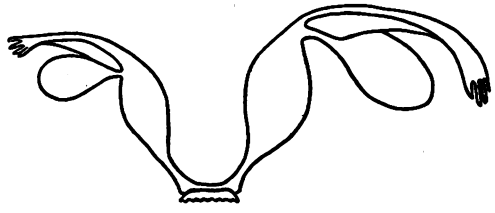

Diagram showing the structures described.

ovary measured $1\frac{1}{2} \times 1 \times \frac{1}{2}$ in. and appeared of normal structure. Corpora lutea and corpora albicantes were seen naked-eye and their identity confirmed microscopically. The right ovary was smaller ($1 \times \frac{1}{2} \times \frac{1}{2}$ in.); sections showed it to be less cellular, and no follicles were seen in the portions cut; but its anatomical relations and macroscopic appearance were normal. The left Fallopian tube was smaller than normal but showed a patent lumen, terminal fimbria, and a typical histological structure. The right tube was about two-thirds of the size of the left and the same features were identified. The left uterus was an uncanalised mass of fibromuscular tissue ($2 \times \frac{3}{4} \times \frac{3}{4}$ in.), and histological examination showed the proportions of muscle and fibrous tissue to be about equal. The right uterus, about two-thirds of the size of the left, was also uncanalised, and there was only about one part of muscle to three of fibrous tissue. The two uteri were attached to one another and to the upper end of the vagina by a fibrous cord some 2 in. long.

In this case it appears that fusion of the Müllerian ducts had taken place only at their lower extremities and that a mass of uterine tissue had formed round each, development on the left side, including ovary

(*Continued at foot of next page*)

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MEDICAL SOCIETIES

OPHTHALMOLOGICAL CONGRESS

THE annual congress of the Ophthalmological Society of the United Kingdom was held in London from April 28th–30th under the presidency of Dr. GORDON HOLMES, F.R.S. At the first session Mr. R. FOSTER MOORE opened a discussion on

Differential Diagnosis of the Causes of Exophthalmos

He said he had estimated proptosis by standing behind the patient, making him look a little upwards, and tilting the head backwards until the summit of the cornea first appeared in view in front of the eyebrow. In diagnosis bilaterality and the direction of proptosis were important. Deep palpation of the orbital contents with the little finger enabled the front edge of the orbital mass sometimes to be felt, revealing its existence, consistency, and position; tenderness might suggest an inflammatory origin. At times, although the tumour could not be felt, the orbital fat was pushed forward and could be made to slip between the skin and the orbital margin. On palpation too proptosis might be found to be reducible, if due for instance to cavernous nævus; or pulsation from an arteriovenous aneurysm might be detected. Limitation of movements was more likely to be general in inflammatory than in neoplastic conditions, although a single muscle might be picked out by a local focus. Certainly there could be a high degree of proptosis from a neoplasm with but little limitation of movement. The immobility in inflammation was probably due to the action of toxins on the muscles, but paralysis was sometimes due to involvement of a nerve, for instance the sixth in cavernous sinus thrombosis. The speaker thought that the ocular palsies accompanying the proptosis in thyrotoxicosis were due to persistent changes in the muscles. Chemosis had relatively little diagnostic value.

Among specific causes of proptosis, it was easy to overlook the presence of an intraorbital foreign body such as a bit of stick in a child. Callus formation had been held responsible, he thought erroneously, for proptosis, for it was not usually formed by membranous bones. Hæmorrhage into the orbital cavity, frequently due to trauma, occurred spontaneously sometimes in hæmophilia and scurvy or from physical causes as in whooping-cough or birth. Inflammatory causes provided the largest group, accounting for 35 out of 117 consecutive cases without Graves's disease. Among them the average age had been 16 in females and 23 in males, mostly originating in the frontal and ethmoid sinuses and hardly ever in the sphenoid or maxillary antrum. In Graves's disease a retracted upper lid might give a false appearance of exophthalmos or of the other eye becoming smaller, or per contra a patient with a drooping lid might complain of the prominence of the other eye. The speaker believed that the apparent enophthalmos of sympathetic paralysis was due to the drooping of the lid which was not accompanied by any misplacement of the eye.

Considering tumours of the orbit, Mr. Foster Moore said that although metastases were rare in the orbit he thought they should be first excluded in all cases of unilateral proptosis in an adult. Arteriovenous aneurysm, one of the rarer causes of proptosis, was easily diagnosed. He had seen one case, a cook who had heard a noise in her head like a pistol shot while she sat peeling potatoes; she had afterwards all the signs of an arteriovenous aneurysm. Although trauma and post-embolic aneurysm were important causes of the condition, he believed that some cases might arise idiopathically from congenital weakness of the arterial wall.

EAR, NOSE, AND THROAT ASPECTS

Mr. TERENCE CAWTHORNE classified the pathological conditions of the ear, nose, and throat under four headings: foreign matter being forced into the orbit; interference with the venous return from the orbit; extension of inflammation to the orbit; and invasion by new growth. Under the first heading the conditions were traumatic and rare. Air had been known to have been forced into the orbit by blowing the nose through a communication between the orbit and nose due either to trauma or a congenital dehiscence. Cases were recorded of water gaining entrance through accidental perforation of the orbit floor during antrum puncture. Cracking of the ethmoidal plate during intranasal surgery might cause bleeding into the orbit. Obstruction to the venous outflow might be caused by growth from the sphenoid or nasopharynx or by thrombosis of the cavernous sinus. Clinically the routes by which thrombophlebitis might reach the sinus fell into three groups: anterior, via the superior ophthalmic vein from a primary focus on the face, nose, front teeth, frontal sinus, or ethmoid cells; intermediate from the antrum or back teeth via the pterygoid plexus of veins, foramen ovale, deep facial and inferior ophthalmic veins; posterior, this (third) route leading mostly from the ear. Inflammation, the commonest cause of proptosis from the laryngologist's point of view, came often from the frontal and ethmoidal sinuses; in children rupture of infected ethmoid cells was sometimes seen, characterised by swelling round the inner canthus, a nasal discharge, pus in the nose, and definite X ray changes. Mucocele, osteoma, carcinoma, and sarcoma constituted the types of large swellings of slow growth that encroached upon the orbit from the sinus. The diagnosis was made on the history of onset, distribution, and the presence or absence of constitutional disturbance and of tenderness. Because of the great strides made during the past decade in the technique of sinus radiography, more and more reliance was being placed on that part of the investigation.

NERVOUS AND GENERAL MEDICAL ASPECTS

Dr. W. RUSSELL BRAIN spoke of the neurological and general medical causes of exophthalmos. Two diseases of the bones of the skull might cause exophthalmos by altering the shape of the orbits and

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(*Continued from previous page*)

and tube, having advanced further than on the right. The point of arrest in the metamorphosis of the Müllerian ducts was presumably antecedent to that which gives rise to a uterus didelphys, and the case was not one of true duplication of the uterus, due to dichotomy of the embryonic cauda, as described by Gemmell and Patterson.

I am indebted to the Director of the Institute for Medical Research, F.M.S., for permission to publish this case, and to Dr. Raymond Lewthwaite, senior pathologist, for the preparation of, and advice upon, the sections.

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so diminishing their capacity. In craniostenosis premature union of some of the cranial sutures made the skull too small for the growing brain, but expansion took place where the sutures remained ununited. The disorder was hereditary and the deformity might develop before birth, during infancy, or later childhood. The orbits were abnormally shallow, their axes deviated outwards, and the exophthalmos might be slight or extreme. Ferrer had reported a case who had acquired the power of voluntarily dislocating his eyes either singly or together by which means he eked out a precarious existence among the saloons of South America. Diabetic-exophthalmic-dysostosis was a rare disease in which softening of the orbital walls caused exophthalmos. A general rise of intracranial pressure might cause a slight degree of exophthalmos but much greater degrees were seen as a result of local presure of a tumour arising in the neighbourhood of the orbit. Meningiomas, slowly growing extracerebral tumours of adult life, formed the most important group. In such cases ptosis due to involvement of the third nerve or of the ocular sympathetic was common and helped to distinguish the exophthalmos from that of endocrine origin which usually had lid retraction. Intracranial aneurysms might also cause exophthalmos by local pressure. They were not syphilitic, but originated in a congenital defect in the muscular coat of the vessel. Most intracranial aneurysms were too small to cause symptoms except those arising from the intracranial portion of the carotid.

Venous obstruction might cause exophthalmos, the most striking condition being due to carotid-cavernous sinus aneurysm. The effect of raising the blood pressure in the venous tributaries to the arterial systolic pressure was a pulsating exophthalmos with a systolic bruit audible to patient and observer and suppressible by digital compression of the carotid. The conjunctival veins were dilated and tortuous, and papillœdema and more or less complete ophthalmoplegia were present. The clinical picture of cavernous sinus thrombosis was similar except for the absence of bruit and the presence of symptoms of acute infection. Impaired venous return from the head resulting from aortic aneurysm, intrathoracic neoplasm, and even severe chronic emphysema might cause exophthalmos which might be associated with marked cyanosis and tortuosity of the retinal veins.

The study of the syndrome of exophthalmic ophthalmoplegia had considerably illuminated the nature of the exophthalmos associated with goitre. The syndrome affected middle-aged individuals and males much more than did exophthalmic goitre; progressive exophthalmos of one or both eyes was associated with external ophthalmoplegia, unilateral or bilateral. The exophthalmos was of the florid type, sometimes called in the United States malignant, with much œdema of the lids and of the conjunctiva which might protrude beyond the anterior border of the cornea. Hyperthyroidism was rarely severe; the condition was even progressive sometimes in patients with subnormal B.M.R. after thyroidectomy. These findings and recent experimental work on the thyrotropic hormone of the pituitary suggested that the exophthalmos might be due to over-production of that hormone.

PROPTOSIS IN CHILDREN

Mr. J. H. DOGGART dealt with the differential diagnosis of proptosis in children. The eye at birth, he said, was about three-quarters of its full grown size so that the infant's orbital cavity was relatively far smaller than that of an adult. Proptosis therefore began earlier and attained more serious proportions in childhood. The eye was also more distensible then. Many of the causes of proptosis were peculiar to children, and Graves's disease was exceedingly rare in them. Myopia and buphthalmia could cause undue prominence by increased size of the eye. The fluid contents of the orbit might be increased by cystic tumours, inflammatory effusions, or by extravasated blood (from wounds, birth injury, hæmophilia, or scurvy). Meningitis sometimes obstructed the orbital fluid by posterior adhesions. Inflammatory pseudo-tumour was a name given to deep infiltrations, often gummatous or tuberculous, displaying the diagnostic features of orbital tumour. Sarcoma was the commonest of the primary neoplasms and might grow so rapidly that it simulated inflammation. Growths arising from the optic nerve, chloroma, Hutchison's tumour, Schüller-Christian xanthoma, dermoid cysts, and cavernous lymphangiomata might also be responsible.

The eyeball was retained in the orbit chiefly by the optic nerve; total ophthalmoplegia led to slight proptosis which might be masked by drooping of the upper lid. Forward dislocation of an infant's eye was occasionally seen from spasm of the orbicularis in a bout of crying. In oxycephaly and in hereditary cleido-cranial dysostosis diminution of the orbital volume might occur.

OPHTHALMOLOGICAL SIGNS IN GRAVES'S DISEASE

Dr. E. E. POCHIN said that an appearance of exophthalmos in Graves's disease might be produced by two different phenomena: an actual proptosis and a widening of the palpebral fissure by retraction of the upper lid, giving the illusion of exophthalmos. He had investigated this lid retraction in a group of cases in which it was unilateral and uncomplicated by exophthalmos. In retraction, he was able to show by films, the eye had a characteristic staring expression, the lower lid was slightly higher on the affected side, and on closing the upper lid was wrinkled as if it were hitched up. He thought the raising of the lower lid was mechanical, being due either to raising of the canthus or to depression of the eyeball.

DISCUSSION

Mr. A. D. GRIFFITH described two cases of arteriovenous aneurysm with exophthalmos.

Mr. J. ELLISON recommended that in such conditions the patient should not be kept recumbent. He thought the common and internal carotid should be tied.

Mr. WILLOUGHBY CASHELL described a case of extreme proptosis following carcinoma of the antrum.

Mr. A. F. MACCALLAN classified the causes of orbital inflammation under the headings simple orbital œdema, orbital subperiosteal abscess, and orbital cellulitis.

Mr. F. W. LAW described a case of proptosis due to spontaneous orbital hæmorrhage in a man immediately before he rowed in the University boat race.

Mr. H. B. STALLARD mentioned that a varicocele of the tributaries of the ophthalmic veins at the apex of the orbit could produce transient exophthalmos; in one case this had led to forward dislocation of the eye on stooping.

Mr. HARRISON BUTLER had been called to a pekinese whose eye had proptosed completely in a moment of excitement. This was apparently a common failing among pekineses; the condition kept recurring in this dog after he had eventually reduced it under an anæsthetic.

Mr. D. V. GIRI reported ultimate good results in a patient who had had a severe initial reaction to a

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radium bomb. He thought the surgeon should not be impatient of the damage produced at first in orbital conditions.

Mr. LINDSAY REA described a case of glioma in a child.

Mr. T. K. LYLE inquired the prognosis in women of fifty with exophthalmos after affection of the ethmoid cells.

Mr. W. C. SOUTER said he had noticed retraction of the upper lid in cases of encephalitis and cerebral syphilis. He had found that photographs to show proptosis were best taken from above the head.

The PRESIDENT emphasised Mr. Foster Moore's remarks about the value of palpation in diagnosis of exophthalmos; the eye could be displaced in Graves's disease with less resistance than in inflammatory or neoplastic conditions. Venous engorgement should be looked for. He, had been much interested by Dr. Pochin's communication; an illusion of exophthalmos given by retraction was often seen by neurologists for example in supranuclear ocular palsies and encephalitis. Ligature of the carotid for relief of arteriovenous aneurysm involved the risk of hemiplegia. A follow-up undertaken for Sir Victor Horsley many years ago had showed this complication to occur in one-third of the cases and in the war among young and healthy men ligation had led to hemiplegia in more than half. He thought Mr. Rock Carling's method of temporary ligature an important one.

ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY

AT a meeting of this society held on April 26th, with Dr. W. N. GOLDSMITH, the president, in the chair, a paper on

Minor Surgery of the Skin

with special reference to biopsy, was read by Dr. J. H. T. DAVIES (Hove). He explained that, in a provincial hospital, methods of treatment must be developed with a view to saving time. For many years he had seen few cases of plantar warts except in private practice, and had always treated them with X rays. He had never had a mishap, and the proportion of failure had been very small. When, however, he had curetted his failed cases, he had noticed that healing was slow and that a woody induration had formed in the underlying dermis. He had therefore wondered whether subsequent injury to the scar might not have undesirable consequences. Radium was unpractical and difficult to control. When surface X ray therapy came into common use, it should be possible to develop a safe and satisfactory technique. The chief disadvantage of curettage was the pain of introducing the local anæsthetic. This could be much diminished by inserting the needle from the dorsum of the foot instead of parallel with the sole.

Some patients had an exceptionally thin dermis, and care had to be taken to avoid penetrating it. Minute warts situated deep in the skin could hardly be treated with X rays on account of the difficulty of shielding the surrounding skin. He first made a small hole with a galvano-cautery, then gave a local anæsthetic, and then enlarged the hole with a Vidal curette or a double-bladed spoon. He packed with wool soaked in trichloracetic acid to stop bleeding, and trimmed the edge with scissors. Freezing with ethyl chloride was effective, but the sole of the foot was resistant, and two sprays should be used simultaneously.

Radon seeds could be quickly and easily inserted into the skin for rodent ulcer by attaching them to the end of a suture, which was drawn through the skin by a No. 4 cutting needle. When the seed was in position it was held by a stitch. In taking skin for a graft, a convenient method was to make a long wheal with local anæsthetic and transfix the site with a row of hypodermic needles through which sutures were threaded; the skin was then clamped and the slip was cut off; the wound was closed by tying the sutures. The slip was cut into small pieces, each of which was stitched into place in the ulcer which it was desired to cover with epithelium.

The first question in biopsy was: Who will interpret the appearances? Perhaps every dermatologist should be his own histologist, but this was a counsel of perfection. There were at least two expert cutaneous histologists in London who were available for consultation, but they should not be expected to give an opinion without a full clinical description and differential diagnosis. The chief inducements to carry out a biopsy were the hope of making a diagnosis of a puzzling condition, curiosity about what lay beneath the surface, and the passion of the collector. Even if all these aims were frustrated, the specimen would provide a record of the case which would last long after the notes had been lost. Of the last 200 consecutive biopsies which Dr. Davies had carried out, in 41 a completely new and surprising diagnosis had been suggested and in 63 a doubtful diagnosis had been confirmed. Biopsy had therefore been positively helpful in half the cases. In 51 cases the slide had shown features of interest unconnected with the problem for which it was made, and in 19 cases a slide illustrating a rare disease had been added to the collection. In only a fifth of the cases had the biopsy given no help at all. Perhaps no other auxiliary method in medicine gave such fruitful results. He had never thought it possible to take dermatology seriously without the aid of biopsy. During the last ten years he had cut more than 800 blocks, and he would have cut twice as many if he had been able to.

He showed his outfit, which could be carried in a small tray, and included a dental-type hypodermic syringe, a scalpel, sutures, a bottle of fixative with identifying label; and a Kilner hook, which he declared to be indispensable to the dermatologist for extracting small pieces of tissue. The outfit, he said, should be always ready for instant use. The ordinary skin department did not possess suitable appliances, nor were any of the personnel trained, either in the biopsy or in the preparation and examination of slides. If some institute would undertake the work of dermatological section-cutting, more biopsies would probably be undertaken. In selecting a lesion for biopsy one should be chosen which appeared to be in a ripe stage, but it might occasionally be more profitable to take a lesion which suggested a diagnosis which it was desired to exclude. The lower third of the leg and the dorsum of the foot should be avoided, because they healed slowly, and the connective tissue of the abdominal wall was difficult to cut. The best place was the face, because even a clumsy wound would heal without permanent scarring. The direction of the incision should follow Lange's lines. In sectioning an ulcer care should be taken to go deep enough, for a piece taken out of the edge might give a completely misleading picture. Some of the subcutaneous tissue should be taken. The slip need only be long enough to make a good show

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on the slide and 2–3 mm. broad. Some of the normal skin at the edge should be taken as well. The section should be transferred to a piece of blotting-paper to remove the blood from the under-surface. It was then put in the fixative, of which the best kind was 70 per cent. alcohol. A Bismostab or radon-seed bottle was a convenient receptacle. The routine hæmatoxylin-eosin stain was not enough, and the pathological laboratory should be persuaded to make four slides of each section, differently stained. Van Gieson was necessary to differentiate the cell protoplasm from connective tissue. Elastica was indispensable for the demonstration of elastic fibres. The slide should be counter-stained with a polychrome methylene-blue, which showed the mast cells and pigment. Pappenheim was the best cytological stain, giving a very clear nucleus and a distinctive colour reaction with plasma cells and mast cells, and showing changes in connective tissue which were too slight to be shown by van Gieson, and foreign bodies such as chalk, which were not stained but had a different refractive index. Dr. Davies showed a film illustrating the operations he had described.

The PRESIDENT agreed that a regular habit of making biopsies would much increase a dermatologist's understanding of disease processes, especially by the interesting sidelights they threw on facts unconnected with the immediate problem. He recommended carbon-dioxide snow for plantar warts on which X rays had failed. He had never seen a scar caused by X rays. He had found plantar warts quite common in hospital practice.

Dr. F. A. E. SILCOCK said that he checked bleeding after curettage with a crystal of trichloracetic acid. It hæmolysed blood and also prevented hæmorrhage. The crystal caused a black coagulum, and the patient might mistake this for gangrene, but it was actually harmless. He considered that the acid might have a specific caustic action on warts. It seemed to prevent sepsis. He had experimented with dental burrs actuated by a portable electric motor borrowed from the chiropodist's practice but found that it ran very hot. Much time could be saved by having the local anæsthetic ready in a closed bottle under pressure, which could be generated by means of a bicycle pump working through a valve. He had found a common steel crochet hook, slightly bent, to fulfil adequately the functions of a Kilner hook.

Dr. ROBERT KLABER commented on Dr. Davies's apparent ill fortune in the use of X rays on plantar warts. Other practitioners seemed to get a large proportion of successes. He also spoke of a greater incidence in hospital practice than Dr. Davies had found. Where X rays failed, he recommended the use of monopolar diathermy with a blunt needle under gas-and-oxygen, which was a quick method, especially against a large number of warts.

Dr. ISAAC MUENDE spoke warmly of formol saline as a fixative. Sections prepared with it many years ago still retained their colouring. Sousa's fixative had given very good results, the nuclear staining being excellent and little nuclear shrinkage taking place. His impression of alcohol was that it caused a certain amount of shrinking and perinuclear vacuolation. An eminent Swiss worker was in the habit of relying on slides stained—not always at all well—with hæmatoxylin-eosin; he was apparently able to detect changes in elastin, and maintained that almost any condition could be diagnosed from such slides. Careful examination would show mast cells. The advantage of Sousa's fixative was that it contained no mercury which blunted the edge of the knife. Carbon-dioxide snow was an adequate treatment for plantar warts. He preferred to pare away the peripheral hyperkeratosis before applying it, in order to reduce the exposure to a minimum. He usually opened the blister after a few hours, and the patient could walk again comfortably on the fifth day. When X rays failed, they often left a troublesome ulcer, or a wart which was difficult to remove. He had found the drilling of warts most unsatisfactory.

Dr. ALICE PETERS said that all plantar warts diagnosed in London County Council institutions had to be notified, because they were definitely increasing among school-children.—The PRESIDENT remarked that they tended to appear in widespread epidemics, and were seldom accompanied by warts in other parts of the body.

Dr. GRACE GRIFFITHS recommended ionisation, which, she said, had been used with success on small children at the Hospital for Sick Children, Great Ormond-street. It was painless, and the discomfort of walking was decreased at once. Many warts came out like a small inverted pyramid, leaving a serrated pyramidal space which quickly healed. The solution was sodium salicylate, 1 or 2 per cent., connected to the negative pole. The whole foot was put into a bath. If a wart were removed from the foot, others on the head or face often disappeared spontaneously in twenty-four hours. The positive pole was led to a bath of sodium chloride, in which the other foot or a hand was placed. Every child who had received six or seven treatments had been cured.

Dr. DAVIES, in reply, said that carbon-dioxide snow was painful and unreliable. However hard the wart was frozen, the line of cleavage might occur halfway across it instead of underneath it. Plantar warts were a disease of school age, and he believed that infected splinters from wooden floors or duck-boards were a frequent cause. He had discovered minute wooden splinters in some of his specimens. The infection might be blood-borne. The function of the galvanocautery was to make a hole in a very small wart, so that the curette could be introduced.

MEDICO-LEGAL SOCIETY

AT a meeting of this society held on April 28th, with the president, Sir TRAVERS HUMPHREYS, in the chair, a discussion on medico-legal aspects of the

Matrimonial Causes Act, 1937

was opened by Mr. WILLIAM LATEY, barrister-at-law. He said that the new Act would bring before the court issues on which it would doubtless look for guidance to the medical profession. A party to a marriage could now present a petition for divorce on the ground that the other party was incurably of unsound mind and had been continuously under care and treatment for at least five years immediately before the presentation of the petition. A person was under care and treatment if he was detained under the Lunacy and Mental Treatment Acts, 1890–1930, or was receiving treatment as a voluntary patient under the 1930 Act immediately after a period of detention. The court would have to decide three questions: whether the respondent had been continuously under care and treatment for the prescribed period, was of unsound mind, and was incurable. The Act contained no definition of the words "of unsound mind," but the court might require to be satisfied that a sufficient degree of unsoundness of mind existed to justify a divorce. Mere confinement

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for five years would probably not always be sufficient proof of unsoundness of mind, for the Act said confinement "and" unsoundness of mind, and the law took a more limited view of mental unsoundness than medicine, because its decisions involved alteration of status and control of property. A petition on this ground could not be served on a respondent unless the medical attendant or the medical officer of the institution were satisfied that this would not be detrimental to the respondent's mental condition. The Act thus threw a heavy responsibility upon the medical man in charge. The test of the required degree of unsoundness of mind might conceivably be whether the condition made married life impossible or intolerable. This was practically the test that had been applied by Sir Gorell Barnes, a former president of the Divorce Division, in Oldroyd *v.* Oldroyd (1896, p. 175), in deciding the question whether one spouse had left the other with reasonable cause so that the other was not entitled to restitution of conjugal rights. He had said: "The truth is that in such cases it has become practically impossible for the spouses to live properly together." The court might, however, give a stricter interpretation to the words "unsoundness of mind" in a divorce suit than in a restitution suit. Some persons who were detained under a reception order behaved for most of their time like normal human beings, but suffered from recurrent manifestations of mental disorder which made it necessary to confine them. The court would probably require from the medical attendants of such persons cogent evidence of the degree of unsoundness of mind. If the respondent were a voluntary patient when the petition was served on him, he might elect to take his discharge. He would then have ceased to be under care and treatment when the petition was heard, and the court might find it impossible to say that he was incurably of unsound mind. It might not be practicable to prove that the respondent was incurable unless he were re-certified. Mr. Latey asked whether the court must be satisfied on medical evidence that the respondent would never be fully mentally sound, even though the condition might so improve that he would not after discharge be again placed under care and treatment; or whether the court must be satisfied that at all times in the future he must remain under care and treatment. If the first test were applied, the court might feel bound to dissolve a marriage although the medical evidence suggested that the respondent, although able to lead a harmless life free from restraint, would remain feeble in mind.

A number of these petitions had already been presented. In one the medical attendant had stated that the respondent's condition was incurable, but in others medical men had expressed considerable doubt. The secretary of the London and Counties Medical Protection Society had asked in the public and medical press [1] whether a doctor who gave information about a patient's condition was committing a breach of professional secrecy. Mr. Latey repeated a suggestion he had made when the Bill was passing through Parliament: that a panel of medical inspectors of the court should be formed, to inspect respondents under the directions of a judge, in the same way as the existing medical inspectors examined the parties to a nullity suit. The Act included a number of new grounds upon which the court could pronounce a marriage to have been null and void. A marriage could be annulled under the old law if one of the parties were proved to have been insane at the time it was solemnised. The new Act provided that, if the petition were filed within a year of the ceremony and the petitioner had not, since ascertaining the facts, had marital intercourse with the respondent, a marriage might be annulled on the ground that the respondent had been mentally defective, or subject to recurrent fits of insanity or epilepsy, or suffering from venereal disease in a communicable form, or that a respondent's wife was pregnant by another man. The phrase "mentally defective" was fully defined in the Mental Deficiency Acts. The courts would have to interpret the vague word "insanity," but epilepsy, Mr. Latey understood, presented little difficulty either to the legal or the medical mind. Wilful refusal by a party to consummate the marriage was now a ground for a decree of nullity, and there was no time limit for the petition. Venereal disease was defined in the Venereal Diseases Act, 1917, as gonorrhœa, syphilis or soft chancre. Whether or not cutaneous venereal itch, evidence of which had been accepted in Stead *v.* Stead (1927) 71 Sol. J. 391 as proving adultery, was a venereal disease within the new Act would probably depend on expert medical opinion. The question might also arise whether inherited venereal disease was communicable.

[1] *Lancet*, March 12th, 1938, p. 634.

DISCUSSION

The PRESIDENT remarked that every case which came before the court was decided on the particular facts. He did not anticipate any greater difficulty in deciding whether a person was incurably of unsound mind than in deciding any other question of fact. The decision lay with the judge, not with the medical witnesses, though they would guide his decision.

Dr. F. J. MCCANN said that the diagnosis of virginity was by no means simple. Some hymens would stretch in a remarkable way, and a classical case was even quoted in which a woman had appeared to be a virgin although she had borne a child.

Dr. J. L. MOIR feared that, whereas the previous law might have chastised medical men with whips, under the new Act some of them would probably be chastised with scorpions. Before it was passed, the laws of lunacy should have been completely reformed and placed on a sure and scientific basis. If a mental patient could only be certified by a panel of experts, and if the prognosis were stated on the certificate, an authoritative record would exist for the use of the court. For the first time in the history of the country a person might have a decree pronounced against him without even knowing that a petition had been filed. The council of the British Medical Association had been advised that an opinion by a medical practitioner that a patient was incurably of unsound mind would not be protected by the Mental Treatment Act, 1930, s.16, and the doctor might, therefore, be open to an action for negligence if the patient recovered. The question of epilepsy was one of the most difficult that medical men had to decide. Venereal disease could be contracted quite innocently, and the Act should have specified only genital venereal disease as a ground for nullity.

Sir ROBERT ARMSTRONG-JONES said he had represented the British Medical Association before the Matrimonial Causes Royal Commission of 1912. He defined an insane person as one who suffered from regression or reversal of the normal instincts, notably those of self preservation and parental care. He did not think that any curable case would be detained for as long as five years. Recovery after five years was highly improbable, though not unknown; less than 5 per cent. of all cases recovered after

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five years' detention. A doctor must not obstruct the law; would he be liable to punishment if he refused to certify incurability?

Dr. R. D. GILLESPIE said that the Bill had caused medical men a good deal of anxiety. Mental hospitals had been unpopular enough with the public before. Medical superintendents were rather reluctant to act, both because of public opinion and because of their sense of loyalty to their patients. These considerations did not apply to outside specialists sent in by the petitioner. The problem of professional confidence was the same as under the old Lunacy Act; the doctor entered on the certificate confidences given him by a patient who often had no wish to see him at all. Medical opinion could never be a matter of certainty; miracles occurred from time to time. Yet a too conservative attitude might stultify the Act. Even after thirty years a dementia præcox case might show complete lucidity. Was "unsound mind" to be equivalent to "certifiable"? Some patients, without ever being normal, might be discharged under suitable conditions, and might be difficulty to re-certify. Many instances of mental disease could be labelled as "not curable" without being "not recoverable." "Curable" and "recoverable" were not synonymous terms.

Dr. E. H. BERESFORD thought curability a very difficult concept; he had seen complete recovery after nine and fourteen years. He agreed with what Dr. Gillespie had said.

The PRESIDENT explained that in each case the court would not have to decide a general problem of curability but whether a particular person was, on the evidence, so unlikely to be cured as to be for practical purposes incurable. The occasional miracle might occur in any type of case. All that any court or doctor could do was to say: "Taking into consideration all the known facts of the case, it is so unlikely that this person will ever be cured for the purpose of leading a reasonable married life that we will regard him as 'incurable' in the sense of the Act."

Mr. LATEY, in reply, expressed disappointment that no distinction had been drawn by the president between unsoundness of mind and incurable unsoundness of mind. Was a certificate of detention for five years sufficient evidence of unsoundness of mind?

The PRESIDENT interpolated that such a certificate would only be supporting evidence to the doctor's examination and opinion.

Mr. LATEY welcomed this statement, as he was not satisfied with a number of original certificates of lunacy which he had read. He was anxious to know whether epilepsy in any form made it impossible for the victim properly to understand the nature of marriage.

MANCHESTER MEDICAL SOCIETY

AT an ordinary meeting of this society held on April 6th, Mr. F. H. BENTLEY communicated the results of

An Inquiry into Thyrotoxicosis

He described the late results of partial thyroidectomy for thyrotoxicosis and the relationship between thyrotoxicosis and gastric acidity. General clinical examinations, basal metabolic rate determinations, blood counts, and fractional gastric analyses (with histamine) were carried out on 84 patients (12 males, 72 females), more than six years after partial thyroidectomy had been done for thyrotoxicosis. The average time since operation was eight years. The clinical results showed that 40 per cent. were completely well with no symptoms of any kind; 23 per cent. completely well except for some palpitation on exertion; 30 per cent. improved and working but still having some complaint such as nervousness, tiredness, dyspnœa, irritability; and 7 per cent. unsatisfactory. One-third of the cases examined had still a basal metabolic rate of more than plus 20 per cent., and a quarter of the cases had palpable thyroid tissue in the neck; while a few of these belonged to the "completely well" group, the majority belonged to the groups where the result of operation was less satisfactory. There was some evidence in this series that sympathetic hyperactivity continued after thyroidectomy and that the sympathetic hyperactive state preceded the thyrotoxic one, being an agent in stimulating the thyroid into the increased activity of thyrotoxicosis. The gastric acidity had been studied in 90 thyrotoxic cases (7 males, 83 females) before operation as well as in the late post-operative series. In those studied before operation there was an incidence of 22 per cent. with anacidity (after correction for the normal incidence of anacidity) and 81 per cent. of cases had a maximal acid secretion of less than 40 units following injection of histamine. The corresponding figures in the late post-operative series were 7 per cent. and 69 per cent. respectively. Thus the secretion of acid, which was depressed during thyrotoxicosis, showed improvement after thyroidectomy but acid secretion did not return to a normal level. While there was no relationship between depression of acidity and the duration of symptoms a tendency for the depression to be more marked in the more severe thyrotoxic cases was noted. Mr. Bentley concluded that apparently two factors are involved in the depression of gastric acidity in thyrotoxicosis: one was removed by thyroidectomy, so permitting acid secretion partially to rise; and one continued to act, maintaining acid secretion at a subnormal level. The former factor was probably thyrotoxic-sympathetic stimulation resulting from thyroid toxæmia, and the latter sympathetic stimulation that was part of the sympathetic hyperactivity in which thyrotoxicosis originated, and that continues after thyroidectomy.

OPHTHALMOLOGICAL SOCIETY'S DINNER.—On the first evening of the annual congress (reported elsewhere) of the Ophthalmological Society of the United Kingdom the members dined together at the Langham Hotel. Dr. Gordon Holmes presided for the second time. In proposing the toast of the Society he referred to the fact there was now a membership of nearly 600, and that three of the foundation members—Sir Thomas Barlow, Sir George Berry, and Sir Lindo Ferguson—were still with them. One feature of the society which had always struck him was its eagerness to maintain close contact with general medicine. In the first presidential address Sir William Bowman had insisted on ophthalmologists having an intimate knowledge of general medicine, while a later president, Hughlings Jackson, had emphasised the value of the study of ophthalmology to neurology. Nettleship held that each surgeon of an ophthalmological hospital should be also on the staff of a general hospital. Although, in the future, public authorities might take a greater part in prevention and in the treatment of disease the aims of the society should and would remain unchanged—namely, the acquisition and dissemination of knowledge of the physiology of the eye and its disorders. Dr. P. J. Hay proposed the Guests very kindly and simply, reply being made by Sir John Parsons and Lieut.-General W. P. MacArthur. Mr. Leslie Paton proposed the President. The toast-list being concluded there was no move to separate.

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REVIEWS AND NOTICES OF BOOKS

Practical Procedures

Practitioner Handbooks No. III. Edited by Sir HUMPHRY ROLLESTON, Bart., G.C.V.O., K.C.B., M.D., F.R.C.P., and ALAN A. MONCRIEFF, M.D., F.R.C.P. London: Eyre and Spottiswoode. 1938. Pp. 293. 10*s.* 6*d.*

EVERY doctor in general practice wants to know exactly how to do treatment or investigation that he might normally be expected to undertake, even if as a rule he prefers to delegate certain jobs. He will find here reliable descriptions of procedures that may for one reason or other be unfamiliar to him. H. L. Marriott and A. Kekwick discuss the various non-oral methods of administering fluids and F. A. Knott the indications for, and technique of, blood transfusion. Sir William Willcox's article on the diagnosis and treatment of poisoning, L. S. T. Burrell's on pleural aspiration, W. G. Wyllie's on lumbar puncture, and Reginald Hilton's on blood-pressure estimation complete the list of medical procedures. On the surgical side, Sir Henry Gauvain describes the technique of plaster-of-Paris bandaging and those who have grown accustomed to the use of this medium will wonder how they ever made do with wooden splints. Circumcision in children by T. A. Ward, the use of two- and three-way syringes by Harold Dodd, injection treatment by David Levi, and local anæsthesia by A. Lawrence Abel are other surgical matters discussed. A. Dickson Wright treats of minor surgical affections of the skin and W. D. Doherty of minor injuries to soft tissues. Sir W. I. de Courcy Wheeler describes an ingenious method of fixing an indwelling catheter in position, though the indications for using this unpleasant method of treatment are fortunately becoming rarer. Charles Keogh explains how and when an ear should be syringed; and there are two articles on clinical pathology: one, by Cuthbert Dukes, on the clinical examination of the urine and one, by L. Whitby, on the value, interpretation, and technique of blood counts.

In his introduction, Sir David Wilkie expresses the view that the recent tendency to hand over to the appropriate expert all special investigations is decreasing and that the general practitioner is himself undertaking more and more of these investigations. Whether or no this is true in fact, the 17 procedures herein described are all well within the scope and province of any general practitioner who has held house appointments and who can bring to the task the necessary time and energy.

Biologists in Search of Material

An Interim Report on the Work of the Pioneer Health Centre, Peckham. London: Faber and Faber. 1938. Pp. 104. 2*s.*

UNDER the present system of medical services the doctor, however knowledgeable he may have become on the diagnosis and treatment of diseases in their early stages, must wait until the patient has realised that all is not well before he can begin to put his knowledge into practice. The primary diagnosis of ill health and the initiative in taking appropriate action depend upon the judgment of the patient himself, warped as that must be by ignorance and the force of economic and family considerations. The staff of the Peckham Health Centre have had a unique opportunity of assessing the value of the patient's judgment in these matters, because there the members are submitted to a thorough medical overhaul and subsequent medical supervision whatever may be their own opinion as to their state of health. In the first eighteen months work at their new building which was opened in 1935 they have examined 500 complete families, representing 1530 individuals, over 5 years. These individuals, they have found, fall naturally into three broad categories, according as their state is one of disease, well-being, or health.

The report is signed by four medical graduates, headed by Dr. G. Scott Williamson and Dr. Innes H. Pearse, and by two science graduates. The writers use the word disease in its sense of subjective discomfort, and the word disorder for the underlying condition causing the disease. In this sense they found that 484 of the 1530 examined showed some disease, and of these only 121 were actually under treatment. A certain number had consulted a doctor but had discharged themselves from his care as soon as he had provided sufficient palliation of their symptoms, but the majority had relied on proprietary or domestic remedies and had never sought medical advice, although consciously suffering for years. The patient it seems will only go to his doctor when the pain, discomfort, or limitation of action due to his disorder more than balance the disadvantages attached to reporting sick. Even where fully conscious of his disorder, he still does not put himself in his doctor's hands until in his own opinion he has lost his social capacity. The most striking fact that has emerged at this centre is, however, the frequency with which a well-defined and almost assertive sense of well-being was associated with objective disorders. These disorders, which ranged from carious teeth to cancer, had produced no conscious discomfort, disability, or interference with the social or occupational activities of the individual. No less than 902 people came under this category, and their disorders did not differ in kind from those found in the category of disease. The nature and seriousness of the disorder did not govern the quality of the well-being, for the most exuberant sense of well-being was associated sometimes with the gravest sometimes with the most trivial disorder. Disorders might be manifest—e.g., tumours, varicose veins, shortness of breath—and the patient be making nothing of them; or cryptic—e.g., cardiac conditions, nephritis, tumours of the uterus, cervix, and breast, glycosuria—and the patient unaware of them. The writers suggest that this sense of well-being springs from effective compensation of the body, and is accompanied by what may be termed subconscious suffering, inasmuch as when the underlying disorder is removed the subject is aware of relief. The sense of well-being is likely to reassure both the individual himself and a casual observer whose advice he may seek, although the efforts of the body at compensation make calls upon its reserves and induce additional wear and tear.

There are at present no means of measuring or detecting health positively and it can only be assumed to be present when no disorder can be detected. The writers of the Peckham report define it as "the physiological condition of an organism living in mutual synthesis with its environment." On another page of this issue Prof. Ernest Barker has something to say of the distinction between negative and positive health, and the contribution which community centres may make to public welfare. He remarks how the purpose of health pervades the whole building

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of the Peckham centre and inspires the whole of its life. Everyone there has a chance to settle their own order of things, a state described by the pioneers as a "sort of anarchy," but which Prof. Barker prefers to call "a sort of polyarchy." Unlike as it is to the general community centre in almost every respect Prof. Barker regards the peculiar development of the Peckham centre as capable of being extended to community centres generally.

1937 Year Book of General Therapeutics

Edited by BERNARD FANTUS, M.S., M.D., Professor of Therapeutics, University of Illinois College of Medicine; and SAMUEL J. NICHAMIN, A.B., M.D., Assistant Attending Physician, Cook County Hospital. Chicago: Year Book Publishers. 1938. Pp. 496. 10*s.* 6*d.*

THIS, the twenty-first annual volume edited by Dr. Fantus in this series, takes the usual form of a classified series of well-written detailed summaries of some hundreds of papers on therapeutic methods and their results, which have appealed to him as being sound, or at least worthy of further trial. Most, but not all, come from the American periodicals, and they are chosen with an eye as much to conditions of general practice as to the possibilities of hospital treatment by elaborate or time-consuming methods. The high light of the year under review is the widespread use of sulphanilamide and the restoration of faith in the possibilities of chemotherapeutics which its surprising success has brought. Papers are presented on its absorption, excretion, and dosage; on its use and effects in hæmolytic streptococcal infections (puerperal septicæmia, erysipelas, scarlet fever, empyema, meningitis), meningococcal infections, urinary infections with *B. coli* and *B. proteus*, gonorrhœa, and gas gangrene; and on its numerous toxic effects. Progress is going on in many other directions, such as the use of vitamins and hormones, the development of therapeutic and prophylactic sera, the treatment of various conditions by artificial pyrexia, and the techniques of local and general anæsthesia; it is all presented here, in compassable form, ready for choice. Dr. Fantus's twenty-one volumes are a notable contribution to the dissemination of medical knowledge, which from the patient's point of view is just as important as the discovery of new remedies.

The Rheumatic Diseases

Edited by Sir LEONARD HILL, M.B., LL.D., F.R.S., Director of Research, St. John Clinic and Institute of Physical Medicine; and PHILIP ELLMAN, M.D., M.R.C.P., Physician to St. John Clinic and Institute of Physical Medicine. London: Edward Arnold. 1938. Pp. 270. 10*s.* 6*d.*

A YEAR ago the medical staff of the St. John Clinic and Institute of Physical Medicine, with the help of certain others, gave a course of lectures on rheumatism to a large number of doctors, most of whom were in general practice, and these lectures have now been brought together in this book. In their preface the editors suggest that the treatment of rheumatism, like tuberculosis, should be under the control of the State, and that there should be similar systems of sanatoria in conjunction with town clinics. If such a scheme is ever adopted the function of the general practitioner may be reduced to one of early diagnosis and of signing the requisite form. In the meantime the problems of rheumatism will continue to occupy a large share of his surgery hours. As Francis Bach emphasises in his chapter on non-articular rheumatic affections, many painful conditions which were formerly thought to be muscular in origin are to-day recognised as secondary to bone and joint lesions, especially of the vertebral column, and the practitioner will find expert knowledge essential if he is to sort out such cases from among his "chronics." At the same time accurate and early diagnosis with energetic treatment on his part would do much to prevent the accumulation of incurable arthritics in hospital out-patient departments and panel doctors' waiting-rooms. The twenty sections of the present book supply him with an account of theory and practice in both acute and chronic rheumatism which cannot fail to stimulate his interest. The varying points of view of the authors, their occasional disagreement—such as on the unitary theory of acute rheumatism and rheumatoid arthritis—and their informal lecture style make the essays entertaining as well as informative.

The Neurotic Personality of Our Time

By Dr. KAREN HORNEY. London: Kegan Paul, Trench, Trübner. 1937. Pp. 299. 12*s.* 6*d.*

THE interest of this volume lies in the fact that it does not concern itself with specific neurotic types, but with the development and struggles of the neurotic character. Dr. Horney makes the important point that we should speak of neurosis only when behaviour deviates from the pattern of a particular culture. Neurosis as a compromise in a given social setting cannot be over-emphasised. There is nothing pedantic in Dr. Horney's exposition, for she illustrates her thesis by a cunning insight into the problems of everyday adjustment, and what she says is likely to be of personal value to the reader however normal he may believe himself to be. The chapter on Anxiety and Hostility is of particular practical value. Although obviously cradled in the Freudian nursery, Dr. Horney has moved far from the parent doctrine, and she gives critical examples in opposition to the theory of infantile origin for all neurotic formations. Her stress on the neurotic need for affection is, moreover, more closely allied to current English views than to the orthodox ones of the Freudian school. This is a book to be read for both enjoyment and instruction by specialist and layman alike.

Practical Physiological Chemistry

Eleventh edition. By PHILIP B. HAWK, M.S., Ph.D., President of the Food Research Laboratories Inc., New York City; and OLAF BERGEIM, M.S., Ph.D., Associate Professor of Physiological Chemistry, University of Illinois College of Medicine, Chicago. London: J. and A. Churchill. 1938. Pp. 968. 35*s.*

THE last edition of this book appeared in 1931 and in the intervening years an outstanding number of discoveries of major importance in physiological chemistry have been made. The authors are now for the first time able to refer to the new essential amino-acid threonine, to show the Meyerhof fermentation scheme, and to give the chemical constitution of no fewer than four hormones and five vitamins. It is not surprising that they have found it necessary to rewrite 13 of the 35 chapters. They are particularly to be congratulated on causing the book to absorb a wonderful amount of new material without increasing its size by more than some forty pages and on maintaining throughout its high standard.

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THE LANCET

LONDON: SATURDAY, MAY 7, 1938

A NATIONAL HEALTH SERVICE

IN April, 1930, the British Medical Association published a detailed scheme for a general medical service for the nation. After eight years' discussion the Association's proposals have been issued in revised form and appear in the supplement of last week's issue of the *British Medical Journal*. The object in view is to promote positive health and to "ensure for all who need it every kind of treatment available for the care of the sick and the prevention of disease." The scheme contemplates that everyone should be provided with the services of a family doctor of his own choice, and (normally through the agency of the family doctor) with such consultant, laboratory and other auxiliary services, and institutional treatment as may be required, the several parts of the complete medical service being "closely coördinated and developed by the application of a national health policy." As a step towards these ends, it is proposed that the existing national health insurance medical service should be extended to include not only the dependants of the insured but also other persons within the £250 income limit, such as small shopkeepers and others in independent business, and persons receiving relief from the public assistance authorities. For all those coming within the enlarged scheme there would be a complete range of consultant, specialist, and auxiliary services. It is thought that the inclusion of hospital care in the extended insurance service would not be practicable, but it is recommended that the hospitals of the country, both voluntary and municipal, should work as one service and in coöperation with the other health services. A plan for a national maternity service is put forward, and the need for it is regarded as so urgent that its establishment should not await the other developments. The essentials of this service comprise antenatal and postnatal care, the services in every case of a certified midwife, a general practitioner chosen by the patient, a supply of sterilised obstetric dressings, and such consultant, laboratory, ambulance, and institutional services as may be necessary, including the provision of "home helps."

It is contemplated that the existing health services of the local authorities, which deal with such matters as infectious disease, mental disease and deficiency, tuberculosis, venereal disease, maternity and child welfare, and school hygiene, would be coördinated with the extended insurance service, but the administration of health functions would be limited to the councils of areas with a population of not less than 75,000–100,000 (according to the predominantly rural or urban character of the area), and the administration of hospital services would be regarded as a "regional problem" that might require combination of local government areas into larger administrative units. The arrangements outlined are not worked out in complete detail; but it is suggested that each local authority charged with health functions should establish a statutory committee concerned with medical and allied services as distinct from environmental health services. This committee would assume responsibility for the extended insurance medical service, the insurance committees being abolished as recommended by the Royal Commission on National Health Insurance in 1926. Though no attempt is made to discuss methods of financing the new arrangements—it is indeed stated that "it is not within the province of the medical profession to express a view on the subject"—the plan lays it down that the contributory principle should be retained, and the service would continue to be "directed in its essentials from the centre and conducted in every area on uniform lines." The new statutory committees of the local authorities would thus be responsible for two important medical services: one consisting, as at present, of medical officers selected and appointed by the local authority, mostly receiving salaries paid from the local rates aided by Exchequer grants; the other consisting of medical practitioners remunerated from funds created by insurance contributions and Exchequer grants, their duties being prescribed in detail by the central authority and the amount of their remuneration being determined by their popularity with insured persons. These two services would, it is hoped, remain distinct while collaborating with each other; but it is difficult to believe that in a national health service so sharp a distinction could be maintained. The Royal Commission on National Health Insurance thought it could not.

> "We are of opinion," they said, "that the difficulties of a composite support to a completed medical service from insurance funds as well as from grants and rates would be so considerable alike in their financial, administrative, and social aspects that some more practical solution must be sought. In particular we feel sure that the wider the scope of these services, the more difficult will it be to retain the insurance principle. The ultimate solution will lie, we think, in the direction of divorcing the medical service entirely from the insurance system and recognising it along with all the other public health activities as a service to be supported from the general public funds."

Even if it be assumed that the medical care of insured persons will, as extended, continue to form part of the insurance system and retain its highly centralised administration, it cannot confidently be predicted that the present method of medical remuneration will be retained. The proposed extension would greatly increase the number of persons receiving medical treatment at the cost of public funds. The insured persons now form about 40 per cent. of the total population; with

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their dependants and the other persons to be brought within medical benefit they would form over 80 per cent.; and the question would at once arise whether, in some areas at all events, medical remuneration might not, in the interests of economy, be on a salaried basis—a change that might have repercussions. The methods of financing the extended service, so far from being a subject outside the province of the medical profession, seem to be of basic importance, and may be found to govern the main features of the changes to be made.

The need for further development of national health services, which is well brought out in the B.M.A. scheme, is emphasised in the recently published annual report of the Department of Health for Scotland for 1937, which speaks of the urgent necessity for constructive regional planning, particularly for the provision of institutional treatment. Modern medicine and surgery have become more specialised and complex, often requiring expensive apparatus and team-work. In consequence there is a growing demand for larger institutions fully equipped and staffed; and since such institutions cannot be provided by the authorities of the smaller local government areas a need has arisen for a reorganisation of hospital services. Under the scheme recommended by the Committee on Scottish Health Services, a statutory hospital committee would be set up for each of the five regions of Scotland, in each of which the cottage hospitals and other smaller units would form a coherent whole, serving as a link between domiciliary practice and the larger hospitals (both voluntary and municipal) which would take part in the health system as centres for consultation and specialised treatment, and at the same time provide, in coöperation with the universities, facilities for ordinary teaching, post-graduate study, and research. The Scottish report lays special stress on the growing importance of the hospital as a primary centre for the development of modern medical practice. The development of hospital services, in consequence of the Local Government Act of 1929, and the enormous extension of hospital contributory schemes, is one of the most remarkable of recent phenomena in the field of public health. Its social significance seems likely to increase, and it may be of the first importance in building the comprehensive health service of the future.

TOXÆMIA FROM BURNS

TRAUMATIC shock, acute intestinal obstruction, and severe burns are all liable to cause rapidly fatal circulatory failure, and it has often been maintained that a factor common to these three kinds of trauma is responsible for their similar effect. Investigation of the three conditions nevertheless continues to suggest differences rather than similarities. In the *British Journal of Surgery* O'SHAUGHNESSY and SLOME[1] offer further grounds for their conviction that in acute traumatic shock the development and persistence of a nervous "barrage" is of fundamental importance. As regards intestinal obstruction opinion is still wavering over the relative significance of fluid-loss into the lumen of the bowel, nervous impulses produced by acute distension, and absorption of toxins through the damaged wall of the gut. That in burns acute toxæmia is the chief danger is indicated by work now reported from Edinburgh.[2]

WILSON and his colleagues recognise five stages in the history of a severe burn: initial shock, secondary shock, acute toxæmia, septic toxæmia, and healing. On examination within two hours of the burn only 5 of the 40 patients studied had blood pressures below normal, and as the cases were specially chosen for their severity it is concluded that initial shock (which is probably nervous) is comparatively unimportant. The next stage, secondary shock, may possibly be attributed to an early toxæmia, but there are reasons for distinguishing it both from toxæmia on the one hand and from the effects of bacterial invasion on the other. Clinically it resembles, or is identical with, the condition known as surgical shock: the skin is cold and clammy, the lips, cheeks, and ears ashen grey, and the rectal temperature subnormal. The blood pressure falls and there may be thirst, air-hunger, and vomiting. The degree of this secondary shock is known to be related to the proportion of the skin surface damaged, and in the Edinburgh cases it was always observed when more than 20 per cent. of the skin was injured. The third stage, acute toxæmia, did not necessarily develop even after the most serious burns. In some cases, however, it was overwhelming, and it is cited as the immediate cause of death in 13 of the 40. It came on at any time between six and fifty hours after the accident, and the first symptom was vomiting, sometimes with altered blood in the vomit. The mental state was characteristic: "the child became apathetic and listless, and yet curiously and sometimes intensely irritable and restless, made repeated efforts to change position, and evinced special resentment at finding the movement of the limbs restrained." The rectal temperature was always high and as a rule hyperpyrexia was persistent and progressive. The circulatory failure was profound in the periphery, but the systolic blood pressure usually remained at or near a normal level till within a few hours of death; the diastolic pressure, however, often rose, and the pulse pressure thus diminished. No sign of anhydræmia could be found; the hæmoglobin content of the capillary blood remained normal. Post mortem there was one most significant and important observation: the liver showed necrosis and degeneration. In the advanced stage the naked-eye appearances were characteristic: the liver was light yellow, soft and greasy, and friable, with an increase of the lobular marking; and microscopically it showed degeneration comparable to that of "acute yellow atrophy." Where death took place in the earlier stage, described as

[1] O'Shaughnessy, L. F., and Slome, D., *Brit. J. Surg.* April, 1938, p. 900.

[2] Wilson, W. C., MacGregor, A. R., and Stewart, C. P., *Ibid*, p. 826.

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secondary shock, no such liver changes were found; nor were they found after death from bacterial infection unless acute toxæmia had been a feature of the illness. Cultures from blisters, fissures, and raw surfaces yielded no evidence of bacterial invasion in the stage of acute toxæmia, and often such cultures showed no growth up to ninety hours from the injury. Hæmolytic streptococcal infection of the burned area, which at a later stage may cause death from septicæmia, is, it seems, not the cause of acute toxæmia. Hypochloræmia and acidosis were inconstant.

This work suggests that, under the conditions of modern treatment, the prevention of acute toxæmia is the most vital necessity in burns. Save in the very worst cases, administration of heat and fluid is effective in combating shock, and the use of tannic acid, especially with an antiseptic such as gentian-violet, has gone far to prevent sepsis. WILSON, MACGREGOR, and STEWART put forward an explanation why tannic acid is not always successful in controlling acute toxæmia: they have noted that very deep, as well as very superficial, burns seldom give rise to severe toxæmia, and it is possible that absorption of toxins from deep burns is hindered by destruction of the vascular dermis. Their conclusion is that when the burn is more than superficial it is essential to ensure the penetration of the tannic acid, and if so it is a matter of some urgency to decide whether this purpose is better served by the stronger or the weaker solutions. Administration of glucose is approved as a means of mitigating damage to the liver when toxæmia has developed.

AIR RAIDS, DISCIPLINE, AND PANIC

FEW now question the need for precautions against air raids; though acquiescence in that need opens up a gloomy prospect of nations organised for war, with their populations trained and disciplined to accept war-like preparation. British traditions and outlook make such methods of national organisation repugnant to us. Yet it is obvious that the civilian population in time of war may be as much exposed to attack as were front-line troops in the last war; and among air-raid precautions must be considered not only material defence but safeguards against breakdown of the morale of the people exposed to attack. War is no longer a more or less gentlemanly affair carried on between a specialised group of combatants on either side.

At first sight the situation seems hopeless, for how can we expect an undisciplined mass of non-combatants to endure without panic conditions that are supposed to call for the prolonged training of the professional soldier? We may, however, be making too low an estimate of the powers of resistance of civilised man, and when we recall that our armies in the last war were made up largely of men who had had little preparation for its horrors and beastliness, we must suppose that our civilisation does not of necessity sap our courage. Shell-shock, a name under which were grouped cases in which the conscious mind of the sufferer was no longer capable of effective control of the fearful emotions even when danger was over, was always an individual breakdown, and is to be sharply distinguished from collective panic, from which our hurriedly trained army was immune, though it has been often described among regular troops. Médecin-Colonel FRIBOURG-BLANC,[1] who refers to hundreds of recorded examples of this typical herd reaction, notes that it can affect the bravest, and describes graphically how the contagious terror spreads from group to group. In curious contrast to such panics is the effect that air raids are having upon helpless civilians in Spain and China; for it is clear that they have led to a stiffening of military resistance—a resistance that must depend upon, and is fed by, the spirit of the civilian population. Man is a herd animal, it is true; but the development of individual freedom of thought and action lessens the herd influence and the likelihood of such a characteristic herd reaction as contagious panic. The training of the soldier, and of the population in some countries, involves the subjection of individual qualities, and the cultivation of an unreasoning acceptance of the beliefs and behaviour pattern of the herd; the undoubted immediate success of this training depends upon the contagion of emotional states that marks the instinct of the herd. So long as the emotional state is fitting to the circumstances all is well, and the emotional state artificially produced in a body of trained and disciplined men, with its subordination of the individual to the organisation, gives a desirable cohesion and unanimity of behaviour. Yet it is now instinctive rather than reasoning and has the all-or-none character of instinctive reactions; if another emotion, such as fear, suddenly appears in a few members of the herd, the ground has been so well prepared for immediate contagion that panic readily follows. We can now understand that 300 panics were recorded in European armies between 1782 and 1815. We have yet to learn how the over-disciplined nation may react to serious reverse, but it is to be noted that TROTTER'S prophecy[2] that Germany would collapse before any fighting took place on her own soil was based upon his study of the nature of the cohesive power of her people.

The advantages of discipline are undeniable; for fighting purposes it is indispensable, and the discipline that depends upon submergence of the individual in the mass produces a formidable machine before which an undisciplined crowd would be helpless, even with equality of armament. Yet, as we have seen, discipline may be no safeguard against panic, and a people still holding to a faith in personal freedom may, against danger and threatening danger, possess a power of resistance which, based upon instincts as all our behaviour must be, is nevertheless more personal and therefore more stable than one that has been built upon the emotional state of the herd.

[1] *Pr. méd.* April 2nd, 1938, p. 521.
[2] Trotter, W., Instinct of the Herd in Peace and War. London, 1916.

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HOLIDAYS WITH PAY

LAST August[1] we drew attention to some of the evidence submitted to the Committee on Holidays with Pay. The Minister of Labour has now presented the committee's report[2] to Parliament, and some of the information it has collected is as important as its recommendations. An attempt is made, in an appendix to the report, to estimate the probable number of work-people who are already receiving holidays with pay, and the proportion is surprisingly large. There are roughly 18½ million manual workers and non-manual workers earning less than £250 a year in the employment field, of whom approximately 7¾ million, or 42 per cent., are entitled to holidays with pay by agreement or custom. If the calculation is confined to those in actual employment, the numbers are reduced to 16¾ million and 7¼ million, the proportion receiving holidays remaining nearly the same—viz., 43 per cent. If all persons are included who do non-manual work but earn more than £250 a year, with the exception of professional workers and those occupied on their own account, the total number of people actually employed at work at December, 1937, was probably 17½ million, of whom about 8 million, or 46 per cent., were enjoying holidays with pay. No account is taken in these estimates of the number not qualifying for holidays by reason of short or changing employment; but, on the other hand, the extent to which domestic servants receive paid holidays is possibly understated.

The extension of this privilege is therefore not such a large problem as appeared when the committee began its deliberations a year ago. It is strongly recommended that an annual holiday with pay should be established without undue delay as part of the terms of contract of all employees covered by the compulsory State insurance schemes, whether at the present or any future income levels. The holiday should be of at least one working week, on consecutive days as far as practicable, and fall within the period of summer time. The arrangements should be made as soon as possible by collective bargaining in industries where this machinery exists for other purposes; an interim period should be allowed for amicable settlement of this kind, but legislation should be passed in the Parliamentary session 1940–41 making such negotiations and agreements obligatory, with provision for settlement by arbitration. For intermittent types of employment, such as building and port transport, earlier legislation should aim at spreading the cost over employers under State coördination. The powers of statutory bodies enforcing minimum rates of wages—i.e., trade boards and agricultural wages committees—should be immediately enlarged to cover holidays with pay. Domestic staff in private employment should be given early statutory entitlement to two weeks' holiday with pay, not necessarily consecutive.

The committee has been impressed with the economic and transport problems already created by the concentration throughout the whole country of holidays in one short period of weeks in the summer, and realises that these would be intensified if its recommendations were adopted. Evidence from the Board of Education indicates that changes in the holiday periods of elementary schools might not present any serious difficulty if local education authorities were pressed by public opinion to consider the matter. In secondary schools the preparation for, and dates of, examinations might make such changes a little more awkward, and the dates of such examinations should therefore be reconsidered. Obviously families desire to be free to go on holiday together as far as this is possible, and the simplest method seems to be "staggering" of the holidays of all sections of the population as between place and place. For instance, a custom has long existed whereby the people of Glasgow and some other towns in the West of Scotland take their vacation in July, whereas August is the holiday month in Edinburgh and the east. The committee favours the development of this practice to cover shorter periods. It adds a suggestion that establishments might be set up, catering on a large scale for workers and their families on holiday, which would be available from time to time for wide areas if staggering of holidays were adopted.

The report contains interesting sections on the history of holidays for work-people, the position overseas and in foreign countries. It is eminently readable and, as will have been gathered, its recommendations are enlightened. In some respects the health of the people has been at least as much influenced in the past by social and industrial changes as by advance in medical knowledge and practice. The mental and physical benefits of holidays with pay may prove to be significant factors for the betterment of the public health.

[1] *Lancet*, 1937, 2, 327.

[2] Report of the Committee on Holidays with Pay. London: H.M. Stationery Office. (Cmd. 5724.) 1s. 3d.

GUY'S

Guy's has the reputation of being a rich hospital; and indeed it was wholly supported by endowments until the end of the nineteenth century and has since made only three appeals. For 150 years the income derived from land in Essex, Herefordshire, and Lincolnshire sufficed to maintain the work in London, but agriculture has been in a bad way since the late war, and the endowments nowadays bring in less than £70,000, whereas the annual expenditure is over £220,000. The idea that the hospital is wealthy no doubt accounts for the comparatively small support it gets from the general public; in 1936 the total from subscriptions, donations, and box collections was only £20,548. Nearly two years ago an appeal was made for £500,000, and on Tuesday last it was announced that Viscount Nuffield, the treasurer, has offered £80,000 for enlargement of the nurses' home provided the remaining £316,000 needed for rebuilding can be secured. A letter appearing this week in our correspondence columns shows how urgent the situation is becoming. Subscriptions may be sent to Lord Nuffield at the hospital (London, S.E.1).

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ANNOTATIONS

CLAIMS ON THE ÆTHER

A RATHER delicate situation arises out of rival claims to the capacity of the æther to serve two masters. One is the public which has to be amused, or instructed, or perhaps advised of catastrophe by means of signals sent by way of certain wave-lengths. The other is the electrologist who has a claim, prior both in time and intent, on these same wave-lengths for medical treatment. Modern diathermy machines emit oscillations which are of similar frequencies to those which will convey information or amusement. Interference is inevitable, but it works only one way: television becomes blurred when operated within a mile of a hospital diathermy set, but the treatment is not upset by the entertainment. Here is a case which might be brought into court and laughed out of it by judge or counsel with the wit to see that there is no reason why both claims should not be perfectly well met. Electrical screening of rooms in which electro-medical apparatus is used is dealt with in a circular issued by the radio branch of the General Post Office. The experts responsible for this memorandum know their job, which is to safeguard the transmission of their particular forms of entertainment; and this memorandum is a very practical one in the sense that it tells us quite clearly that interference can reach a radio receiver by only two means, either (1) by conduction along the mains or (2) by radiation direct to the receiving aerial. Mains-borne interference can be easily got over, but direct radiation is a much more difficult matter; it can only be suppressed by enclosing in an electrical screen or Faraday cage not only the apparatus but also the patient and the operator. The cost of dealing with a room 12 by 16 by 8 ft. in this way is about £20; if it is done at the time the department is planned this sum would include the cost of screening the room and fitting a mains filter. The G.P.O. memorandum overlooks the possibility of allocating to hospitals as their prerogative certain bands of wave-lengths in the æther. If this were done the designers of instruments would, we think, bend their energies to devising apparatus capable of emitting the particular range of frequencies in workable intensities. Furthermore it might very well lead to a salutary development in the efficiency of diathermy and other appliances, and the abandonment of apparatus depending upon spark excitation. The valve is a more trustworthy emitter than the spark, and its potentialities have not yet been exhausted.

TRANSPLANTATION OF EPITHELIAL TISSUES

THE successful use of transparent corneal grafts to replace corneas rendered opaque by injury or disease is now becoming almost commonplace. Prof. Filatov of Odessa, one of the chief exponents of the method,[1] now suggests its application to the treatment of chronic affections of other epithelial structures.[2] He has found, he says, that various tissues, preserved in the cold, have a therapeutic action when transplanted into diseased tissues of the same histological type, and his idea is that their action as transplants is "autocatalytic." In the cornea the toxic substances which are produced by inflammatory processes are neutralised by this autocatalytic process, and the protoplasm is restored to its normal intracellular disposition. In other tissues the specific property is similarly re-established; elasticity, for example, is restored to the skin or to the sclera. Preserved tissues are usually employed; skin, cornea, mucous and vascular membranes have all been used. The autocatalysis takes place in the tissues of the host, but it is said to be stimulated by the catalysers of the transplant. Filatov has successfully applied the method of transplantation in a case of retinitis pigmentosa and in one of tuberculous uveitis. In a case of pannus, mucosa was transplanted with a good result. Skin has been transplanted in psoriasis and in a case of cutaneous tuberculosis in a rabbit—apparently with good effect. Preservation of the skin up to four months does not appear to destroy its properties. The character of the pathological process is regarded as relatively unimportant so long as the transplant is of the same histological type as the tissue into which it is introduced. The first case of lupus in which Filatov tried the method gave results that surpassed all his hopes. He excised an ulcer and covered the defect with skin taken from a cadaver and preserved in the cold. Within 48 hours there was conspicuous improvement; the ulcer cicatrised rapidly, and healing took place both of the face and of the mucous membrane of the nose. In 26 days the healing process slowed down but it was restored by further transplant of pieces of skin. In a case of lupus of the hand, similarly treated with skin from a cadaver, improvement was sudden. By the 17th day after operation the greater part of the ulcer was cicatrised and the infiltratng tissue had been absorbed. Similar success has been obtained in two further cases of lupus of the face, in one case of scleroderma, one case of cutaneous cicatricial hypertrophy, and in one case of ulcer of the leg which had refused to heal. The transplanted skin in these cases is regarded by Filatov not merely as a covering for the defect produced by destruction of the skin, but as the agency that cuts short the pathological process. As he regards the corneal transplant in a similar light, he is here pressing home an analogy that might not be generally accepted.

[1] Filatov, V. P., *Lancet*, 1937, 1, 1395.
[2] Filatov, *Journal Médicale* (Kiev), 1937, 7, 757.

BLOOD PRESSURE AND EMOTIONAL INSTABILITY

THAT physiological tests can profitably be used to eliminate would-be aeroplane pilots who are psychologically unfitted for the work began to be recognised during the war. Those most in touch with the problem of selecting aviators are satisfied that unstable or neurotic men will not do; the requirements and stress of flying do not accord with a fundamentally nervous temperament, however brilliant and daring the occasional exploits which such a temperament may provoke. Continued efforts have therefore been made to substitute readily made physical measurements for a lengthy subjective psychological method, more like history-taking, of detecting candidates who are emotionally unstable without being obviously so. At the physiological research laboratory of the United States Army Air Corps, the director, Captain Armstrong, has found a surprisingly high correlation between the cardiovascular findings and the emotional stability of a series of 700 applicants for flying training.[1] Those who were assessed by the customary personality study as emotionally unstable were found to have readings above an

[1] Armstrong, Harry G., *Amer. J. med. Sci.* February, 1938, p. 211.

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arbitrarily fixed blood-pressure level of 134/90 mm. Hg or a pulse-rate of 90. Allowance was made for a range of 3 points on either side of each arbitrary figure, and findings within that range were credited with agreeing with the results of the personality study. The correlation between instability and high cardiovascular findings for the whole group of unstable candidates was 0·88.

In all sorts of occupations a ready means of detecting emotional instability would be welcome, though it would be stupid to assume that mild emotional instability is necessarily a disqualification or defect. It is moreover necessary to recognise, as Captain Armstrong does, that his correlations were obtained with healthy young men and cannot safely be supposed to hold true for women or for other age-groups and perhaps not even for young men in other countries.

The experience of the Royal Air Force seems to be[2] that systolic pressure up to 160 is relatively common in candidates, and that provided the diastolic is between 80 and 60 and the cardiovascular efficiency normal, the high systolic reading may safely be ignored. A point of interest in the investigation is the discovery of as many as 399 rated as unstable among the 700 normal young men examined. This high proportion may suggest an explanation of the alarmist and exaggerated statements often made about the incidence of neurosis in the general population; it depends solely on the physician's arbitrary standard as to whether he calls a man neurotic or normal (though perhaps emotionally unstable). With a sufficiently rigorous standard only the phlegmatic can escape being called neurotic.

X RAY THERAPY AT VERY HIGH VOLTAGES

DURING the last five years electrical engineering in the United States of America has advanced so rapidly that there are now a number of X ray plants operating at a million volts. Of these one of the most ingenious and reliable is the static apparatus described by J. G. Trump and R. J. van der Graaff,[3] and an account of clinical work with this apparatus which operates regularly at 1,200,000 volts is given by Richard Dresser and Jack Spencer from the Collis P. Huntington Memorial Hospital, Boston.[4] They have treated 101 cases of malignant disease, and they have already noted important differences distinguishing the effect of supervoltage radiation from ordinary X ray therapy at 200 kv. The two important advantages claimed are increased skin tolerance and greater penetrating power which allows a much higher depth dose to be given to deep-seated tumours, with much less general reaction in the form of nausea and vomiting. The regions in which most benefit may be expected from the use of high voltages are the œsophagus, the bladder or prostate, and the uterine cervix, but there is said to be an improvement, particularly from reduced systemic effect, in the results obtained in cancers of the breast and of the pharynx and larynx. In this country the only therapy set designed to operate at a million volts is that at St. Bartholomew's Hospital. Much careful work has already been done on the physical side, and L. H. J. Phillips and G. S. Innes described to the British Institute of Radiology at a meeting on April 7th the tests which they have already carried out. These show that the high output from this Metropolitan-Vickers constantly evacuated tube allows the use of filters heavy enough to remove all longer wavelengths from the beam, leaving only these wavelengths for which the American workers claim great advantages. Doubtless those conducting X ray therapy research at various centres in this country are now anxious to obtain for trial this elaborate and costly apparatus whose efficiency on the physical side seems to be established.

CROSS-INFECTION IN DIPHTHERIA WARDS

THE study of the serological and other types of bacterial species has led to several practical developments and one of the most important applications, as yet only partially explored, of the newer work has been to the study of cross-infection in wards and institutions. Serological methods, as Dr. Allison clearly shows on another page, provide a means of tracing with considerable precision the spread of infection from patient to patient and they make it clear that much infection of the kind which may be called "preventable" takes place among the inmates of hospitals. Using F. Griffith's slide agglutination method for following up cross-infection with hæmolytic streptococci, Okell and Elliott[1] have shown that a considerable amount of such infection is almost normal in the average oto-rhinological ward. Keevil and Camps's work on similar lines suggests that it is probably far more common in the general wards of hospitals than is realised.[2] Gunn and Griffith[3] and more recently Allison and Brown[4] have shown how reinfection with hæmolytic streptococci may take place in scarlet fever wards. Drs. Glass and Hedley Wright[5] have now studied cross-infection as it occurs in diphtheria wards. These authors have not used the serological method but have based their conclusions on the study of changes in bacterial type (gravis, mitis, and "intermediate") which take place in patients during their sojourn in hospital. The method is not of course as precise as that of agglutination, but it provides clear and abundant evidence that cross-infection in diphtheria wards is both prevalent and serious. On the basis of a study of 246 patients in such wards the conclusion was reached that 36·6 per cent. of patients become infected with a new type of diphtheria bacillus during their stay in hospital. Among patients warded for more than two months the rate of cross-infection reached the still higher figure of 68 per cent. Looked at from another angle it appeared that the persistence of diphtheria bacilli in the nose or throat was responsible for the hospitalisation of 76 per cent. of cases and of these persistent cases 80 per cent. could be referred to cross-infection. Glass and Wright state that they have recently seen at least a dozen cases in the course of a few weeks in which stays in hospital of from 120 to 160 days were due solely to this cause. They calculated that the cost to the administration was about £50 a patient. Disease is always a costly affair to the community and even the more extravagant methods of preventing it can generally be shown to be sound political economy. The prevention or even the substantial reduction of cross-infection in hospitals and similar institutions would certainly call for some reforms in organisation, which would not only be very sweeping and very expensive but would incidentally bring with them new problems in hospital administration. Once the public as well as the profession are convinced of the need for them, economic and administrative con-

[2] The Medical Examination for Fitness for Flying. London: H.M. Stationery Office. 1936.
[3] *Amer. J. Roentgenol.* 1937, **38**, 758.
[4] *New Engl. J. Med.* March 10th, 1938, p. 218.

[1] Okell, C. C., and Elliott, S. D., *Lancet*, 1936, **2**, 836.
[2] Keevil, N. L., and Camps, F. E., *Ibid*, 1937, **2**, 207.
[3] Gunn, W., and Griffith, F., *J. Hyg., Camb.* 1928, **38**, 250.
[4] Allison, V. D., and Brown, W. A., *Ibid*, 1937, **37**, 152.
[5] Glass, V., and Wright, H. D., *Ibid*, March, 1938, p. 248.

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siderations will give way to ethical ones. Meanwhile all concerned will be increasingly uncomfortable and from this discomfort may arise a solution which will be practicable without drastic reorganisation.

A BROADCAST ON RHEUMATISM

IN America May 2nd is observed as National Child Health Day and this year the American Heart Association marked the occasion by an international broadcast on rheumatic heart disease. Lord Horder, as chairman of the British Empire Rheumatism Council, spoke from the B.B.C. and was followed, from the other side, by Dr. Homer Swift of the Rockefeller Institute, Dr. William J. Kerr of San Francisco, and Dr. T. Duckett Jones of Boston. The speakers gave figures illustrating the importance of the disease, and outlined the ways in which it is treated. Even practitioners in day-to-day contact with acute rheumatism may not have fully appreciated its prevalence; Lord Horder said, for instance, that its incidence among large numbers of children amounts to nearly 5 per 1000 per year. Further, rheumatic diseases of all kinds in this country were responsible for a sixth of the total illness and caused more suffering and deaths than cancer and tuberculosis combined. To those still sensitive to the novelty of transatlantic broadcasting the impressiveness of those statements was increased by the voices from America saying that the prevalence was about as bad over there. And as if to give us some idea of size they referred to treatment by sending patients from northern States to subtropical or tropical climates. This procedure has received much attention in the U.S.A., but as Dr. Duckett Jones said, it has not been entirely satisfactory; there are wide annual variations in the recovery of rheumatic fever subjects in southern climates where the disease is rare, and severe recurrences have been observed after a sojourn in the south; so that if a patient goes south at all it seems advisable to leave him there for several years at least without even summer visits to the north. At present transportation is recommended only for patients whose resources allow them to live in the chosen climate.

STERILISATION OF THE MENTALLY UNFIT IN DENMARK

ON June 1st, 1929, the first Danish law providing for the voluntary sterilisation of the mentally unfit came into force. About five years later it was replaced by a law that reflected the experiences gained in the interval. In 1935 yet another law provided not only for sterilisation, but also, in certain special cases, for castration. In *Nordisk medicinsk Tidskrift* for Feb. 19th (p. 281) an account of the workings of these laws is given by Dr. J. Nörvig who is in charge of a Danish institute for the mentally defective. In Denmark they are classified in three main groups according as they are idiots (an intelligence quotient of 0–30), imbeciles (I.Q. 30–55), or suffering from debilitas mentalis (I.Q. 55–75). There are approximately 35,000 persons in Denmark belonging to one or other of these categories, but only about 10,000 are under the control of the authorities. Many of the remaining 25,000 must be regarded as high-grade mental defectives. Since the first law came into force, some 300 women and some 100 men have been sterilised. The overwhelming majority of these cases represented debilitas mentalis, and so far no idiots and only a few imbeciles have been sterilised. The operations were usually performed between the ages of eighteen and twenty-five, and of the 300 women about 270 have been discharged from the institution for mental defectives, evidently finding some useful niche in society in most cases since only 14 have had to be readmitted. Of the sterilised men, all have secured their discharge, and only 2 have had to be readmitted. Some of the women, but none of the men, have married after sterilisation and discharge. The 400 operations were followed by 2 deaths, one from pneumonia, the other from intestinal obstruction. Up to date no women and only 30 men have been castrated in Nörvig's institute. All were over the age of twenty-five, and most were over thirty. The indication for castration was always some sex abnormality which had led to two or more criminal acts in relation to women or children or of a homosexual character. Of these 30 men, 22 have been discharged without the recurrence of a single sex crime, and only one has had to be readmitted—on account of theft. In Nörvig's experience, castration eradicates sex impulses more quickly and completely in such cases than it does when the person operated on is mentally normal. He has found that, on the whole, the initiative and capacity for work of these men were unimpaired by the castration, and nearly all of them expressed satisfaction with the operation, many of them explaining that they felt more at ease now that they had no longer to dread uncontrollable sex impulses. Nörvig concludes: "Lastly, were I to give my general impression of the results already achieved with the sterilization and castration of the mentally defective in Denmark, I would say that the results encourage us to continue. But we must follow the voluntary principle, for legislation of a compulsory character in this sphere excites opposition in the community and can thus discredit this important cause to such an extent that its sane development may be imperilled."

THE UNDERSTANDING DOCTOR

A DOCTOR who has spent more than 40 years in general practice either becomes complacent or gets into the way, as Dr. F. G. Layton says he has done, of asking "why" uncomfortably often. Pertinacious curiosity is the very mainspring of research and it is clear from his most recent book[1] that he makes inquiries where constructive answers may be expected and not where they could be regarded as an impertinence. His whole book shows what a friendly rapport there is between his patients and himself. It is not every practitioner among the poor who, once identified, in response to a query shouted from the upper regions, as "the doctor," is bidden to "come on up" *whatever* is happening. That this attitude has its embarrassing moments is shown in the stories of patients—they are much more than case notes if less than elaborate psychological studies—which provide the fruit of the rich cake he has prepared for the reader's consumption. Though it can be finished at a session without subsequent indigestion, it is best savoured in slices. Some of the ideas that Dr. Layton holds strongly, for example on the unkindness involved in the confinement of harmless mental defectives, had been sketched in his provocative contribution to Grains and Scruples in April last year. He shows here, too, his sympathetic interest in the education of the physically "delicate" and his story of the G.P. insisting, against two very potent forces—the fussy mother and the specialist—on sending a boy to boarding school will hearten many a family doctor. Not that Dr. Layton favours

[1] Behind the Night Bell. By F. G. Layton. London: Faber and Faber. 1938. Pp. 289. 8s. 6d.

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a robust policy for its own sake. It is because he translates psychology into understanding and has come to regard it as the most real thing in his professional life that his book contains material which will bring a new point of view to readers of very different types—from specialists concerned with miners' nystagmus to those who play any part in the running of public services, official or voluntary. It is especially to this last group, and not only to its professional members, that we commend this disarming plea for more considerate treatment of the adult or child in trouble.

A TRIBUTE TO SIR JOHN McFADYEAN

IN the German scientific world it has long been customary to pay homage to distinguished men, after long service, by the publication of a *Festschrift*, or special number of a journal containing papers written by colleagues and pupils. This excellent habit is spreading to our own country, and the associates of Sir John McFadyean have used it with dignity to celebrate the conclusion of the fiftieth volume of the *Journal of Comparative Pathology and Therapeutics*. Sir John founded this journal in 1888 as a private enterprise, and has since edited it almost single-handed. We can recall only a single similar achievement—namely, the founding and editing for fifty years by the late Sir Frederick Pollock of the *Law Quarterly Review*. Sir John's colleagues asked him to give them a free hand to prepare the number for last December, and the response from the admirers of his work throughout the world has shown unmistakably the range and magnitude of his services, and the impression his personality has made. The *Festschrift*[1] contains a varied and most interesting collection of material. Its frontispiece is a characteristic portrait of Sir John at the present day, and this is followed by three pictures taken at various stages of his life. Tributes from friends in many Imperial and foreign countries are published, including articles from Prof. R. von Ostertag and Dr. Reinhold Schmaltz of Germany, Prof. E. Leclainche of France, and Dr. John R. Mohler of the United States. Special articles trace the history and development of the journal and of the man himself, and give some account of his disciples. An example is given of his skill and force in debate, and of his command of language and of the essential points of a question. The number also contains valuable articles on veterinary pathology and McFadyean's contribution to the unravelling of many of its problems, especially that of bovine tuberculosis. We are glad to think that Sir John belongs to the medical as well as the veterinary profession, and he has the congratulations, thanks, and warm good wishes of both.

CEREBRAL DAMAGE AFTER ANÆSTHESIA

MEDICAL journals have lately contained so many accounts of damage to the brain observed after administration of anæsthetics that it looks as though we were up against a comparatively new, and very unwelcome, post-operative phenomenon. We know of no records in the older literature of anæsthesia that are at all similar to those reviewed in our columns in the past few months,[2] which provide illustrations of the histological changes found post mortem in the cerebral cortex of patients dying after (usually) prolonged inhalations of nitrous oxide. We have given reasons for thinking that Courville[3] is right in attributing the degenerative cellular brain changes to the effect of anoxæmia. The latest contribution to this subject, by Gebauer and Coleman,[4] is interesting in that cyclopropane, not nitrous oxide, was the anæsthetic concerned. With cyclopropane large proportions of oxygen are always administered, and anoxæmic changes seem correspondingly unlikely to develop while it is being given. Gebauer and Coleman's patient underwent thoracoplasty which took 2¼ hours; it was done under cyclopropane after preliminary injection of sodium Amytal (3 grains), morphia (gr. ¼), and atropine (gr. 1/150). The patient had pulmonary tuberculosis and one may presume that there was deficiency of working lung area. She recovered consciousness for a short time only, and died, after continued cerebral symptoms, a week after operation. The post-mortem histological examination of the brain showed advanced degenerative processes involving the ganglion cells of the entire cerebral cortex.

The reason why fatalities of this kind are commoner than formerly is presumably the greater frequency of severe and prolonged operations. However successfully these are conducted, and however gratifying their immediate results, it behoves us to remember that prolonged anæsthesia, even apart from the associated surgical trauma, is unnatural and not always innocuous. Evidently it may cause a degree of cellular anoxæmia that cannot be detected during operation, but may nevertheless give rise to serious and even fatal damage to the cells of the brain cortex. Beyond all others in the body these are susceptible to lack of oxygen.

RADIOGRAPHIC DIAGNOSIS OF PLACENTA PRÆVIA

RADIOLOGISTS are still trying to find satisfactory means of ascertaining the position of the placenta in the uterus, especially when it is in the lower segment. "Amniography," or the injection of an opaque substance into the amniotic sac through the abdominal wall, is too dangerous to be much used; it will probably outline the placenta, but it may kill the fœtus or induce premature labour. An alternative is instillation of two or three ounces of sodium iodide into the bladder; for on radiography after this procedure a low-lying placenta will often be represented by an abnormally wide space between fœtal head and bladder wall. Dr. E. Rohan Williams[5] suggests that a cystographic examination of this kind is advisable whenever there has been antepartum hæmorrhage; and certainly the method is both safe and simple. The objection, for what it is worth, is that the finding of a placenta prævia could hardly increase the care that is given to any case of antepartum hæmorrhage; while if nothing was seen on radiography there might be a temptation to relax the watchfulness with which one should regard any warning hæmorrhage, whether accidental or unavoidable.

Mr. PERCY FURNIVALL, consulting surgeon to the London Hospital, died at Northam, Devon, on May 3rd, after a long illness.

Dr. A. P. LUFF, who died last Sunday at the age of 82, was in his time a leading authority on the nature and purpose of foods, especially in their bearing on gout and other metabolic disorders. He retired from the medical staff of St. Mary's Hospital, Paddington, more than twenty years ago.

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[1] *J. comp. Path. Ther.* December, 1937. Croydon: H. R. Grubb. 7s. 6d. [2] *Lancet*, 1937, 2, 1325
[3] Courville, C. B., *Ann. Surg.* March, 1938, p. 371.
[4] Gebauer, P. W., and Coleman, F. P., *Ibid*, April, 1938, p. 481. [5] *Brit. J. Radiol.* April, 1938, p. 202.

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CONTROL OF THE COMMON FEVERS

STREPTOCOCCAL INFECTIONS

Reviewed by Dr. V. D. ALLISON, *Medical Officer of the Ministry of Health; late Pathologist to the London County Council*

THE hæmolytic streptococcus is probably the most dangerous and certainly the most elusive of the common infecting agents. To the public mind a streptococcal infection suggests well-defined clinical pictures like puerperal fever or erysipelas. But the streptococcus has no limited habit; it may make itself felt, now in an explosive epidemic of tonsillitis among school-children on a milk-round, now in a lymphangitis affecting a group of nurses being immunised against diphtheria, now in middle-ear disease running round a measles-ward, now in the so-called relapses of scarlet fever. The streptococcus has been found so widely distributed as to vitiate any conclusions to be drawn from its identification in patients, carriers, or fomites, but recently it has proved possible to distinguish certain types of streptococcus by serological tests. This has in its turn made it possible to determine the source of infection, and the path of its spread and the knowledge thus being gained is likely to become of signal value in the control of disease. I propose to set down here the present status of our knowledge.*

R. C. Lancefield (1933), in the United States, showed that *beta* hæmolytic streptococci, among which are the most actively pathogenic streptococci, could be separated into groups by a precipitin test, and she found that the great majority of strains associated with human disease fell into her group A. F. Griffith (1935) then went on to show by serological analysis that strains belonging to group A, isolated from scarlet fever, tonsillitis, erysipelas, puerperal fever, impetigo, &c., comprised a number of well-defined types, identified by agglutination with specific sera. No one type is exclusively associated with a typical clinical syndrome, but in the early investigations four serological types—viz., 1, 2, 3, and 4—were identified as being commonly associated with scarlet fever and now, ten years later, these same four types still stand out as the chief cause of scarlet fever in this country, accounting for upwards of 50 per cent. of all cases in London (Ministry of Health 1936).

At present some 26 types of *Streptococcus pyogenes* have been defined and a high proportion of strains from human disease can now be identified with certainty; it seems likely in fact that not many more strains of epidemiological importance in human disease remain to be classified. The complete classification of pathogenic streptococci is rendered difficult by the multiplicity of types, but this very multiplicity is of real help in tracing the sources and paths of spread of infection. Group classification by the Lancefield method, on the other hand, is of no value in tracing sources of infection, as by it one cannot free from suspicion subjects who may be harbouring group-A streptococci belonging to serological types easily differentiated from that causing the outbreak under investigation. It is useful, however, in excluding hæmolytic streptococci not of pathogenic importance but not uncommon in normal throats.

* Based upon a paper opening the discussion at a recent meeting of the fever hospital medical service group of the Society of Medical Officers of Health.

TRACKING DOWN AN EXPLOSIVE OUTBREAK

The value of type identification in the investigation of the source of infection and paths of spread in explosive outbreaks of streptococcal infection may be illustrated by four recent examples.

I

In March, 1935, an explosive outbreak of scarlet fever and tonsillitis occurred among the pupils of two schools at Denham in the Eton rural district. The affected children had been having at the schools a daily ration of one-third of a pint of raw bottled milk and had fallen ill almost simultaneously. No similar illness occurred among 58 children attending one of the schools who regularly consumed a ration of malted milk, or among those pupils who had no milk. Throat swabs from 23 of the patients yielded profuse growths of *Str. pyogenes*, type 1. The same organism was also isolated from the throat of one of the milkers at a farm from which the bottler obtained most of his milk, and from the milk of a cow drawn by this milker. When the same cow was milked by another milker the organism was not found in the milk. Further investigation showed that the two children of the affected milker had a streptococcus of this type in their throats and that both of them had been absent from school with sickness and sore-throat for the two weeks immediately preceding the outbreak—an illness which was probably scarlet fever, as one of them gave a history of rash on her chest early in her illness. In all there were 87 primary cases of scarlet fever and 13 secondary cases, 75 of the primary cases being pupils at one or other of the two schools. In addition to the 87 primary cases there occurred simultaneously an unknown number of cases of sore-throats and kindred conditions of streptococcal origin without the characteristic rash. All the sufferers had consumed the milk raw.

II

The outbreak in Chelmsford and district in August, 1935, involved some 1600 cases of tonsillitis and scarlet fever, caused by milk infected with *Str. pyogenes*, type 2, conveyed from the throats of milkers on a farm, all four of whom had suffered from sore-throat due to the same type of streptococcus immediately before the outbreak. This outbreak has been fully reported by Camps and Miller-Wood (1936).

III

The Doncaster outbreak in December, 1936, of nearly 400 cases of tonsillitis and scarlet fever, due again to infection of milk with *Str. pyogenes*, type 2, which has been reported by Watson (1937), had an origin in many respects similar to that of the Denham outbreak, but was of especial interest in that one of the herd of 31 cows developed an acute mastitis and excreted a streptococcus of the same type 2 in her milk for a period of over two months. This cow had been milked regularly by the farm-hand whose child was suffering from otitis media and who had himself contracted a sore-throat about the time of the commencement of the outbreak, both infections being due to the same streptococcus.

IV

An outbreak of a different type occurred among the nursing staff of a large hospital who were being immunised against diphtheria with T.A.F., the course of events being as set out in Table I.

TABLE I

	Doses given.	Sequelæ.	T.A.F. batch.	On duty.
Wednesday	40	6 abscesses	1	Dr. A, Dr. B, Sister X.
Thursday	36	No infections	1 and 2	Dr. B, Sister Y.
Friday	30	6 abscesses	2	Dr. B, Sister X.

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The infections were all very severe, with lymphangitis and high temperature, and surgical interference was required in every case. Pus from all the abscesses yielded pure cultures of *Str. pyogenes*, type 1. Examination of nasal and throat swabs revealed that Sister X who had been suffering from a mild cold was harbouring this streptococcus in her throat. It is significant that the day Sister X was off duty no infections occurred. Inquiry revealed that the technique of sterilising the syringes and needles was faulty and there is little doubt that infection was spread via the sister's hands and a bowl of saline used to rinse out syringes and needles.

OUTBREAKS OF PUERPERAL FEVER

Serological typing of the streptococcus has also proved its value in numerous outbreaks of puerperal fever, the identification of the infecting strain giving an important clue leading on the one hand to the discovery of the source of infection, whether in the patient herself or from the nose or throat of her attendants; and on the other, to what is of almost equal importance—viz., the elimination as the source of infection of attendants who may be carrying a type of streptococcus different from that found in the patient. Dr. Dora Colebrook (1935) has quoted several successful investigations of this nature. Legal decisions and recent correspondence in the medical press indicate the importance attached to this problem.

Cross-infection in Hospital Wards

Streptococcal infections of many kinds may be studied in the wards of special and general hospitals. They include infections of the upper air-passages such as scarlet fever, tonsillitis, pharyngitis and their sequelæ, otitis media, rhinitis, and sinusitis, as well as such streptococcal infections as impetigo contagiosa, adenitis, and erysipelas. Serological typing of *Str. pyogenes* from patients in the scarlet fever wards of fever hospitals over long periods (Allison and Brown 1937, and Brown and Allison 1935) with close concurrent clinical observation have led to the following two definite conclusions:—

I

Patients nursed throughout their illness in cubicles or chambers show no change of the serological type of the infecting streptococcus; that is to say, there is no evidence that mutation occurs in the throat.

First with Dr. W. A. Brown and recently with Dr. D. J. Hishon, I have completed the study by weekly swabbing and type identification of 55 patients nursed throughout their illness in cubicles or chambers; change of type occurred in one case only, a patient infected with type 4 becoming reinfected with a type 2. The patient in the next cubicle was infected with type 2; she was a tall girl and could easily have passed a pencil, toy, or sweet over the partition without the knowledge of the staff, although she was not seen to do so.

With Dr. Hishon I am also at present studying the segregation of scarlet fever patients in small wards according to the type. So far we have investigated by weekly swabbing and clinical observation 20 patients: 13 in a type 1 ward and 7 in a type 2 ward. Two reinfections have occurred, both in the type 1 ward. One girl got a "relapse" 13 days after admission and a throat swab yielded a profuse growth of *Str. pyogenes*, type 4; at the same time the sister in charge of the ward had a slight cold and sore-throat, but was not off duty—she was found to be harbouring type 4 in her throat. The other patient, convalescent and about to be discharged, was found to have a heavy, though symptomless, throat infection with *Str. pyogenes*, type 12. Swabs from the staff revealed that the domestic assistant was carrying type 12 in her throat; she left the staff immediately afterwards and it was not possible to obtain any information as to whether she had been ill.

II

Infection by one serological type of streptococcus does not necessarily protect a patient against infection by another type. The so-called "relapse" in scarlet fever is in reality a fresh infection by a streptococcus picked up in the ward and differing serologically from that causing the primary infection; the source of the reinfecting type may be found most frequently in another patient in the ward or more rarely in a member of the ward staff. In multiple-bed wards for scarlet fever at least 50 per cent. and probably nearer 70 per cent. of the patients become reinfected with one or more fresh types of streptococcus during their period of detention in hospital; in these cases as in the "relapses" the reinfecting type or types can always be isolated from another patient in the ward or, rarely, from a member of the ward staff. Reinfection may be latent, giving rise to no clinical signs, or manifest, accompanied by clinical signs and complications. Early complications during the first two to three weeks of illness are in the great majority of cases caused by the primary infecting type of streptococcus, while complications occurring in multiple-bed scarlet fever wards during the third week of illness and subsequently are in the great majority of cases caused by reinfecting types of streptococcus.

These findings afford convincing proof of what many clinicians have suspected for years. What are the probable paths by which the streptococcus spreads in hospital wards, and what evidence have we in support of the various theories put forward?

DIRECT CONTACT

It is generally agreed that infection by direct contact is probably the chief mode of spread. Let me give two examples.

(*a*) A patient suffering from scarlet fever due to *Str. pyogenes*, type 4, and still confined to bed, became reinfected with type 1 within 36 hours of direct contact of the only other patient in the ward; the latter who was convalescent and allowed up for the first time 36 hours earlier was still harbouring the type 1 which had caused his attack of scarlet fever.

(*b*) A medical officer personally treated and dressed an acute otitis media (a very severe case) due to type 1, and herself went down 24 hours later with scarlet fever due to the same type.

INDIRECT CONTACT

Infection may also occur indirectly (*a*) through the intermediary of a nurse or doctor conveying infection from patient to patient. There is no doubt that this method of transference of infection does occur, and it has been demonstrated particularly in relation to outbreaks of puerperal fever in maternity homes and maternity wards of hospitals. Again the contact may take place (*b*) via toys or handkerchiefs, and so forth; multiple serological types of streptococcus have been isolated from such articles as pencils, beads, teddy bears, handled and probably sucked by convalescent scarlet fever patients, and from swabs of dining table and eating utensils taken after convalescent patients have had a meal; the types found (2, 3, and 4) were those harboured by the patients who had sat at table. The organisms have also been found in swabs from the lockers of scarlet fever patients, probably introduced by handkerchiefs and other articles handled by them.

DROPLET INFECTION

Infection may be conveyed in the air by droplets from coughing and sneezing or by dry dust particles.

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Droplet transmission is accepted as one of the most frequent modes of conveying infection from the upper air-passages. In my own experience I have never been able to obtain cultures of hæmolytic streptococci from acute cases of scarlet fever or measles on cough plates, 3½ in. in diameter, at a range greater than 12 in. from the patient's mouth. At greater distances they probably exist but very large plates 12 in. or so in diameter would be necessary as targets to catch the droplets. The evidence that droplets can be infected with hæmolytic streptococci is definite and only a slight degree of air movement would suffice to spread this form of infection through a ward.

DRY DUST PARTICLES

This probably occurs and evidence in support of that opinion is accumulating.

Table II shows the results (Brown and Allison 1937) of exposing blood-agar plates in four scarlet fever

TABLE II*—NUMBERS OF COLONIES OF *Str. pyogenes* ON PLATES EXPOSED IN FOUR SCARLATINA WARDS

Time of exposure.	Ward.	Sites of exposure. A	B	C	D	E	F	Total.
Night ..	I.M.	—	—	—	—	—	—	—
Morning .	(22 beds,	13	19	6	10	14	8	70
Afternoon	22 patients)	4	2	2	2	4	4	18
							Total	88
Night ..	N.S.	1	—	1	—	—	—	2
Morning .	(22 beds,	33	20	31	20	28	26	158
Afternoon	22 patients)	23	24	24	10	27	18	126
							Total	286
Night ..	I.V.	1	—	1	14	—	3	19
Morning .	(22 beds,	30	62	55	105	47	35	334
Afternoon	19 patients)	32	45	51	30	41	29	228
							Total	581
Night ..	B.1	2	1	0	1	0	0	4
Morning .	(23 beds)	20	16	14	19	22	23	114
Afternoon		15	18	11	23	9	16	92
							Total	210

* Adapted from *J. Hyg., Camb.* 1937, **37**, 1.

Night = 12.30 to 3.30 A.M.
Morning = 7.30 to 10.30 A.M.
Afternoon = 1.30 to 4.30 P.M.

wards during three three-hourly periods within 24 hours, the figures representing the number of streptococcal colonies on the plates. Such large figures as these were totally unexpected and that is why experiments were carried out on as many as four wards. These results can be regarded in another manner if we take for example the N.S. ward and read the columns across. Each plate being 3½ in. in diameter and therefore 11 sq. in. in area, the total colonies in the last column down represent the number of organisms settling on an area of 66 sq. in. (there being six plates)—i.e., less than half a square foot in three hours. The floor area of the ward was 120 ft. by 26 ft. = 3120 sq. ft. or 449,280 sq. in. If (Table III) this column (2, 158, 126) represents the

TABLE III—WARD N.S.

	Colonies in 3 hrs. on 66 sq. in.	Colonies to be expected in the same time on 3120 sq. ft.
Night	2	13,614
Morning	158	1,075,506
Afternoon	126	1,057,682

total numbers of colonies of streptococci at each period falling on an area of 66 sq. in., the total number that might reasonably be expected to fall over the floor area of the ward is represented by 13,614, 1,075,506, and 1,057,682—these figures being calculated on the assumption that one colony on a plate represents the development from a single coccus. In reality such a colony may represent a mass of air-borne cocci. When we associate these figures with the fact that 22 patients are actively inspiring streptococci-laden air at the rate of about 13·7 cubic feet per hour, and adding to the air infection by the forcible expiration of coughing and sneezing, it does not need much stretch of the imagination to accept the view that infection by particles in the air is no chimera. These figures are in their simplest form and do not take into consideration such complicating factors as degree of air-movement and the air exchange in the ward. The importance of these factors is shown in Table II by comparing the night, morning, and afternoon figures. In these experiments we know also that the types of streptococcus isolated from the air are exactly those types found as infecting agents in the patients in the ward.

MEASLES WARDS

The investigations I have quoted on the spread of streptococcal infection have been mainly concerned with scarlet fever wards, but, with Dr. Brown, I have been able to show that the problem is one of equal importance in measles wards.

A ward for measles was opened and filled with 19 acute cases within 48 hours. Swabbed on admission, 6 out of the 19 were carrying streptococci. One week later out of the same 19 patients, 13 were found to be carrying streptococci—i.e., 7 fresh carriers, and 6 out of these 7 were infected with one or other of the same serological types of streptococcus as had been isolated from the 6 original carriers on admission. And note that all the patients were still confined to bed (Table IV).

TABLE IV—MEASLES WARD

Total number of patients—		
Swabbed weekly in the ward over a period of seven weeks	43	
From whom *Str. pyogenes* was isolated on admission	18	(41·9%)
Cross-infected with *Str. pyogenes*	22	(51·2%)
From whom *Str. pyogenes* was isolated at some time during their period of isolation in hospital	35	(81·4%)
Number of these 35 patients who showed clinical manifestations of infection with *Str. pyogenes* ..	22	(63%)
These 22 patients were divided into two groups as follows:—		
1. Number of patients with complications due to *Str. pyogenes* which was present on admission	9	
All with otitis media, which was present on admission to hospital in 5 cases, and occurred after admission in 4 cases.		
2. Number of patients with complications due to cross-infection with *Str. pyogenes*	13	
Made up as follows:		
Otitis media	7	
Scarlet fever with otitis media ..	1	
Rhinitis	1	
Rise of temperature, mild sore-throat, and malaise	4	

Note.—Out of 17 cases of otitis media in the series, 8 were the result of cross-infection occurring in the ward.

Out of 43 measles patients swabbed weekly in the measles ward over a period of seven weeks, 18 were carrying streptococci on admission and cross-infection with streptococcus occurred in 22 patients, just over half the total number of patients investigated. Streptococci were isolated from 35 of the patients at some time during their stay in the ward, and in 22 of these the infection was accompanied by clinical manifestations. These 22 patients were divided into two groups according as the infecting streptococcus was (1) present on admission, or (2) the result of cross-infection in the ward. There are 9 in the *first* group all with otitis media, the infection being present in 5 cases on admission to hospital, and occurring after admission to hospital in 4 cases; in the *second* group there are 13 cases—viz., otitis

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media 7, scarlet fever with otitis media 1, rhinitis 1, rise of temperature and malaise only 4. Out of 17 cases of otitis media in the series, 8 resulted from cross-infection in the ward. Moreover of these 43 patients, 20 were discharged well and free from complications, but of the remaining 23, 7 were transferred to other wards of the hospital and 16 were transferred to another hospital. We may assume that, although these 23 patients had passed beyond the scope of our inquiry, they were still being exposed to the risks of cross-infection with the possibility of further complications, prolonged invalidity, or permanent physical disablement.

Okell and Elliott (1936) and Keevil and Camps (1937) have in similar epidemiological studies described the spread of streptococcal infection in the wards of general hospitals, while Cruickshank (1935) has also collected a considerable body of evidence and broadened the field of investigation still further in his work on the streptococcal infection of burns.

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SPECIAL ARTICLES

COMMUNITY CENTRES
IN RELATION TO PUBLIC HEALTH AND PUBLIC WELFARE *

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THERE is a passage in an article written by Edwin Chadwick, a year or so before I was born, somewhere about the year 1873, which may serve as an introduction to my theme.

"It has long been painful to me to observe a large proportion of our population, especially growing up young men, with sedentary occupations, in our civic communities, under conditions to engender disease and painful existences, from deficient bodily exercise. This is more particularly observable of those now crowding into . . . suburban residences, beyond distances for such proper daily exercise as may be obtained by walking."

Chadwick, in his somewhat whimsical way, thought that the cure for this defect might be found in a two-wheeled velocipede, pedalled at the rate of six, seven, or eight miles an hour. I wish to suggest that the problem which he observed confronts us to-day on a far greater scale, and that the cure, or one of the cures, may be found in the community centre.

What is a community centre? In order to answer the question, we must go back to the causes from which it springs. Since the end of the war the "crowding into suburban residences," of which Chadwick spoke, has assumed gigantic dimensions. In the suburbs of our great towns, and sometimes even in the country, great new housing estates have arisen—mainly municipal, but also, in part, privately built and privately developed—on which some millions of our population have been settled and cantoned. They live there under better physical conditions: they have better houses, better sanitation, and a better air: they have also, as a general rule, their own little garden plots. But the residents of a new housing estate are also a population of *déracinés*: they have been uprooted from their old social environment: they need, and they instinctively seek to form, a new society, in which they can strike their roots and from which they can draw their spiritual sustenance. This new society takes the form of a community association—an association of the residents on the estate, or at any rate the more stirring residents, who desire to act in common and to constitute a voluntary community for the promotion of their common interests. The first common interest may be gardening: that widens into a common interest in physical recreation; that widens again into a common interest in general social recreation; and that becomes, in the last resort, a common interest in the common cultivation of leisure. Young and old participate in the movement: it is something juvenile as well as adult: it will thus involve, in the course of its growth, a double organisation, which must yet be single as well as double. All in all it is a healthy movement towards adjustment to a new environment: it is a movement away from malaise towards harmony with new surroundings: it is, in a word, a natural biological movement, actively seeking to accept and embrace the facts of environment. The community association is not a piece of manufacture. It is a simple biological growth—a simple growth of *life*, in the widest sense of the word.

Once formed, the community association desires and begins to construct a home. That home is the community centre, and I am here concerned with the facilities which such a centre can provide for the development of physical well-being. But before I embark upon that theme, I wish to dwell, for a moment, upon the scope and the extension—the geographical scope and extension—which the movement towards community centres is likely to attain.

Community centres will not be confined to new municipal housing estates. They will also grow, and indeed they are already growing, on new private housing estates. Nor is that all. Apart from new housing estates on the circumference of our towns, whether those estates be municipal or private, there are two other sorts of areas on which community centres have grown or are growing. In the first place there are central areas, in the very heart of our towns, which have been cleared and covered with a number of flats on a system of block-dwelling. The central block-dwelling, like the suburban housing estate, may be either municipal or private: in either case it needs, and is beginning to develop, its own community centre; and when this happens, the community centre effects a new and further lodgment in the very core of urban life. . . . But the movement does not stop at towns, and it is not confined to urban areas. Over and above the area of the towns there is also the area of the countryside and the country village. Community centres developed here even earlier than they developed in any of our towns. They had indeed a different name. They were called village halls. But they

* Parts of a Chadwick lecture delivered in London on May 5th.

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were fundamentally the same sort of thing; and when we talk of the movement towards community centres we must not forget that it also includes the village hall, and that it found its first harbinger and promise in the village.

POSITIVE AND NEGATIVE HEALTH

What a wonderful opportunity is presented by the community centre. Here is a voluntary body, voluntarily occupied with activities which make for that active and happy condition which we call by the name of health. The more a man can make health for himself, the more it is really health—positive health, which far transcends the negative health which comes from the avoidance or the prevention of disease. Now the State, in its pursuit of a policy of public health, has hitherto been largely occupied with what may be called negative health, and it has been using the means of compulsion towards that end. It has enforced a system of sewers: it has enforced a system of insurance against sickness and invalidity. Here is an opportunity for a new and brighter chapter. The State can devote its efforts to the cause of positive health. It can do so in the one way possible when that cause is in question—the way which is not the way of compulsion, but the way of coöperation and partnership with voluntary and spontaneous effort. Men have to make positive health for themselves, and they are trying in these community centres to make it for themselves. The State can enter here to help those who are helping themselves. It can help by equipping the community centre with the aids and the general apparatus which will enable it to do more fully what it is already attempting to do. That is why I have called the community centre a wonderful opportunity. If the State attempted *de novo*, without this basis, to promote the cause of national fitness—for mothers and children, for juveniles and adults—it would be driven into the foundation of State institutions and the establishment of some sort of State drill. It would attempt to make from outside that positive health which can only be genuinely made from the inside. It would be engaged in a contradictory and self-defeating operation. The community centre gives the State the chance of success, because it gives it its natural and necessary ally.

PHYSIC AND PHYSIQUE

There are various ways in which the community centre can be encouraged by public aid to make its maximum contribution to the cause of public health.

(1) One way is simple and initial; and it is a way which has already been tried. The local authority may arrange to house in the community centre some of its statutory services for the promotion of general health. It may arrange for a maternity centre: it may arrange for an infant welfare centre: it may even arrange, as Swansea is proposing to do, for a general medical wing, including a dentist's room. There are a number of advantages in the housing of such statutory services in a community centre. They are brought into the general voluntary atmosphere which inspires the centre. Those who frequent the centre for its voluntary activities will be led to notice, and to use, these statutory services. The rooms which are used for such services, being only required in the daytime, may be made available in the evening for the general voluntary purposes of the centre. With give and take between the two sides, and with a general statesmanship of accommodation, this method of dovetailing (if it may so be called) is likely to aid both the authority and the centre, and to secure a joint collaboration in the cause of health. The authority will benefit by a larger use of its services. The centre will gain both from the enjoyment of greater facilities of health for its members and from the provision of greater space for its general activities.

(2) But it is in the relation of the National Fitness Council to the community centre that the largest prospect of collaboration discloses itself. The community centre, as it develops its potentialities and begins to find its true form, appears as a double building—partly juvenile and partly adult. One part will be reserved for youth: another part will be reserved for the more mature: still another part will be common to both. This general conception, and this general plan for the structure of the community centre, had already been reached before the National Fitness Council was instituted. But the conception and the plan, as they stood about a couple of years ago, went no further than a common central hall, with wings on either side, distributed and planned on the basis of age, for indoor meetings and for indoor recreation and exercise. The coming of the National Fitness Council has imported a new and a larger idea. The idea is that of physical training—physical *self*-training, with the aid of skilled teachers or guides—with a view to the promotion and the ensuring of general physical fitness. That idea, if it is to be realised, means the addition of new dimensions to the structure of the community centre. It means the addition of a gymnasium and a swimming-bath: it means the provision of further rooms for indoor games and indoor forms of physical recreation. It also means, or it may also mean, the addition of outside facilities, in close proximity to the centre—a bowling green, tennis-courts, playing-fields, and the like. The National Fitness Council has a fund of £2,000,000 in hand from which it can aid and promote these additions. Of course that fund can be used, and will be used, to aid bodies and institutions other than community centres. It can be used to aid clubs: it can be used to provide running-tracks, youth hostels, holiday camps, and every sort of organisation and activity connected with the general cause of national fitness. But the community centre is likely to be particularly affected, for more than one reason; and since the community centre is my particular theme, I shall confine myself to discussing the effects of this fitness movement upon it, and the contribution which it can make to this movement.

FITNESS OF BODY AND MIND

It is a natural thing that community centres should be drawn into the scope of this fitness movement. In the first place they are voluntary institutions; and as such they provide the voluntary atmosphere—the club atmosphere—in which alone a national movement towards physical health can really thrive. But what is true of the community centre in this respect is also true of a variety of clubs—boys' clubs, girls' clubs, the Y.M.C.A., the Y.W.C.A., and similar bodies. It is a second and different consideration which particularly explains why the community centre may be particularly drawn into collaboration with the movement for national fitness. This consideration is one of finance or economy. A community centre is a general centre, intended for all alike, both young and old, within the area which it serves. Facilities given to it have a wide application

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and a general use. There is thus an economic argument for making it the beneficiary of facilities. "A centre," it has been said, "because of the opportunities it offers for a wide range of activities, might more easily pay its way than smaller and more isolated units, such as swimming baths and gymnasia, which might be uneconomical to build and costly to maintain."

This argument makes the community centre a natural recipient of facilities, and therefore a natural contributor to the cause of fitness for which the facilities are provided. But perhaps two cautions may be suggested, or two caveats entered. One is a caveat on behalf of the various voluntary clubs which have long been labouring, for their own particular connexion and from their own particular angle, in the cause of physical development and fitness. They too deserve their recognition; and it would be a pity if they were starved while community centres were fed. The other caveat is on behalf of the community centre itself. It has indeed a contribution to make to the cause of national fitness; but it has also a contribution to make—and this is perhaps its major and more bounden contribution—to the cause of national culture and the general mental life of the nation. It must not forget the body; but equally it must not forget the mind. Drama and music, study circle and discussion class, are an essential part of its activities. There is room in the community centre for swimming-bath and gymnasium; but there must also be rooms—a number of small rooms—for the rehearsing of plays and music and the wrestling of mind with mind. Health and play of the body are very great things; but they must lead up to and issue in the health and play of the mind. It is an old problem of our public schools to attain a balance between the claims of athletics and the claims of the mind. It may also become a problem of the community centre.

Subject to these caveats and safeguards, the community centre may well become a centre of the national movement for national physical fitness. In that process, as it develops, there will be a curious English mixture of factors and a curious English compromise between different considerations. The local authority will provide the building of a community centre; the national fitness council, representing the central authority, will provide, or help to provide, additional physical facilities; the voluntary organisation called the community association will inhabit and manage the building and voluntarily use the facilities. That is an artificial simplification of the picture; in practice things will be even more complicated, and the blending of State action and voluntary effort will show further refinements and further niceties—for example, when it comes to the provision of physical instructors or leaders, and to settling who is to employ them and what is to be their position. It is all very different from the stern simplicity of State drill and State labour camps which we find in contemporary Germany. Our English reliance is on what the members of a voluntary group will freely and voluntarily do when once they have been provided by the public authority with facilities to make themselves fit members of their country. It is a reliance honourable both to those who place their trust in the people and to the people in whom such trust is placed. On the one side opportunities and facilities are furnished in faith; on the other side those who receive these chances are expected and trusted to choose and to use them wisely, each electing the way which suits him best for the attaining of what he needs most.

THE PECKHAM HEALTH CENTRE

(3) There is a still further development of the community centre, in its connexion with the cause of health, which lies beyond anything hitherto mentioned. It is a development peculiar as yet, at any rate so far as I know, to the Peckham Pioneer Health Centre, but capable of being extended to community centres generally. Where this development is attempted, the community centre goes beyond being the home of some statutory medical services provided by the local authority; it goes beyond being a place furnished with facilities for attaining health and fitness through the use of physical exercises and the practice of physical training; it becomes a general voluntary medical centre—a centre in which the purpose of health is not a thing housed in an annexe, or something belonging to special rooms and special apparatus, but pervades the whole building and primarily inspires the whole of its life. The Peckham Pioneer Health Centre, both in the method of its inception and in its general character, as it now stands, is different from the general run of community centres. It has not arisen on a new estate, and it has not grown from a spontaneous development of community feeling and community organisation among the people themselves. So far as I know, the Health Centre has been set down by its promoters in an old-inhabited area which they themselves selected and which they demarcated themselves to suit their own purposes. Having set down the centre in this area, and having in mind a particular medical purpose for the centre, they invited members to join in a way which suited their purpose. They made the unit of membership the family, as a symbiotic group with common physical characteristics. The whole family—husband and wife and children—must join; and one weekly family subscription, covering and including all the members of the family, must be paid to the centre. The purpose for which families were thus to join and subscribe was a purpose of regular medical overhaul of all the members of the family, followed by appropriate remedial medical services, for the correction of defects revealed by the overhaul, either by means of agencies outside the centre (the hospital, the panel doctor, and the like) or by means of the action of the centre itself.

But the centre, as it now stands and as it has always been planned, is not merely a medical centre for regular overhaul and health supervision. If it were only that, it would not have sufficient continuity of operation to keep its members together; it would have no steady magnetic power which enabled it to hold its family units in a constant allegiance and under a constant care. The centre is therefore a social centre, over and above being a medical centre. It has a fine swimming-bath and gymnasium; it has provision for indoor games; it has refreshment rooms; it is a general communal focus, with a common social life and common social recreations. On the other hand it does not issue in any community association, or in any system of community management and community government. A group of doctors are the centre of the centre. As part of their scheme they provide facilities for a common life of physical and social recreation; and they trust to little spontaneous formations, emerging for each activity according as occasion demands, for the sectional management of each phase of the common life—the music, the drama, the swimming, the gymnastics, or whatever it may be. In their own words they "proceed by merely providing an environment rich in opportunities for action—that is, giving

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a chance to do things"; and having done that they put their trust in what they call "a sort of anarchy," or, as it might also be called, a sort of polyarchy, under which members are left to themselves and their own devices to initiate their own activities and to settle their own order of things in each of their several spheres.

This is a brief and perhaps bald description of a peculiar and notable experiment. Those who desire to study it further will find the opportunity in a pamphlet which has just been published, entitled "Biologists in Search of Material" and containing an interim report on the work of the Peckham Pioneer Health Centre. There is much that is *sui generis* in the record here submitted. The Peckham centre is unlike the general community centre in almost every respect—in the method of its inception; in the nature of the area it serves; in the primacy and dominance of its purpose of health; in the method of its government, which is that of a medical directorate flavoured, or coloured, by a sort of spontaneous polyarchy for the different activities that flourish under the encouragement of the opportunities provided by the directorate. It would be idle as well as ungenerous to criticise the Peckham centre because it does not conform to the general pattern of community centres. The real question which its existence and its work suggest is whether other community centres of a different type—centres which have spontaneously arisen in a natural area of neighbourhood under the prompting of natural occasion, and which are backed by a community association and a system of community government—can learn from the Peckham centre lessons for their own benefit.

THE MEDICAL SERVICE

It is suggested in the pamphlet to which I have referred that they may learn such lessons. It is suggested that some attempt should be made to incorporate the method of regular overhaul and health supervision in existing community centres, or at any rate that no new community centre should be planned without catering for some form or other of this service. Something of that sort may well be attempted; but a good deal of thinking will be necessary to secure that it is done on a voluntary basis, and that anything which is done is done in close and amicable coöperation both with the officers of the statutory medical services and with the general medical practitioners who are immediately and personally responsible for their patients. The matter is too tangled and difficult for a layman to express any opinion of any value. But it seems possible, *a priori*, that a medical service for juveniles and adults might be provided in community centres, were it only in connexion with the development of physical exercise and physical training. Such exercise and training would be all the more effective if they were backed by advice—advice which enabled a man to decide what he particularly needed in view of his particular constitution and his particular defects. Whether such advice should be organised on a purely voluntary basis, on the analogy of the poor man's lawyer, or whether it should be offered as part of the medical service of the local authority, is a question which may be left to experiment and trial. Whatever the method adopted—and I should myself incline to the method of using the medical service of the local authority, for the main if not the exclusive purpose of making the physical activities of the centre more effective and more productive—there seems to be good and sufficient reason for including some measure of medical service among the general activities of the community centre.

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

EDINBURGH PATHOLOGICAL CLUB

FIFTY years ago the Edinburgh Pathological Club was founded, partly at the instigation of Sir John Batty Tuke. The first secretary was Dr., later Sir German Sims Woodhead, F.R.S. Of the original members, among whom was Prof. W. S. Greenfield, three survive, namely, Sir Robert Philip, Sir Richard Berry, and Prof. William Russell. To celebrate its jubilee the club held a dinner last week at which fifty members were present. Sir Robert Muir, F.R.S., gave an interesting account of early days and others who spoke were Prof. Sydney Smith, Dr. Edwin Bramwell, Prof. Stuart McDonald, Prof. Theodore Shennan, Dr. Chalmers Watson, Prof. Henry Dryerre, and the secretary, Mr. C. P. Stewart, Ph.D. Prof. A. M. Drennan presided.

The members of the club are recruited from the younger research workers in Edinburgh who welcome the opportunity of bringing their results forward for discussion in a domestic atmosphere and regard membership of the club as an honour. The range of subjects in the annual programme is wide, including morbid anatomy, biochemistry, experimental surgery, experimental pathology, and veterinary diseases. It is a satisfaction to members that several pathological clubs have been formed on the same lines in other places, for example Glasgow and Newcastle, by former members of the Edinburgh club. This remains one of the places at which those interested in medical research congregate, and its usefulness seems likely to continue.

OPHTHALMOLOGICAL RESEARCH

In a previous letter I referred to the gift of £40,000 made by Mr. William H. Ross to endow research in the study and prevention of blindness. The W. H. Ross foundation, as it is called, has now been formally declared open. Its headquarters are in 20, Lauriston-place, Edinburgh, and the director is Colonel R. M. Dickson, M.D., D.O.M.S., who has wide experience of ophthalmic work. The income from the fund is in the hands of trustees, among whom is Dr. A. H. H. Sinclair. The aim of the trustees will be to stimulate investigation in diseases of the eye and already studies are in progress that have involved the examination of hundreds of miners. Dr. Sinclair and Prof. A. J. Ballantyne, who spoke at the official opening of the foundation, stressed the need for team-work in ophthalmic research. It is hoped that the W. H. Ross foundation will become a centre for work carried out not only in Edinburgh but elsewhere in Scotland.

UNITED STATES OF AMERICA

(FROM OUR OWN CORRESPONDENTS)

THE MEDICO-ECONOMIC CONTROVERSY

JUDGING from comments in the English medical press there is some misunderstanding of the origins and status of the medico-economic controversy in this country. Clear thinking is desirable and first and foremost an appreciation of the position of the American Medical Association. This association is a federation of local societies, the unit being the county medical society. Each such unit is self-governing within the rather broad regulations of the State and

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national societies. Each unit sends a certain number of delegates to the State society annually, the number of such delegates being based on the number of physicians who are members of the local unit. At each annual State meeting delegates are chosen to attend the House of Delegates of the American Medical Association, the number thus chosen also depending on the number of physicians who are members of the State society (at present there is one delegate to each 825 members or fraction thereof). The governing body of the American Medical Association is, therefore, the House of Delegates, representing each State on a proportionate basis chosen in this manner. This House of Delegates has the power to adopt any policy it wishes under the constitution and can amend the constitution providing such amendment lies over for a year. The House of Delegates meets yearly at the time of the annual convention and in the same place. Facilities, however, are provided for special extra meetings under certain circumstances and such meetings have been called on several occasions. In the interim the affairs of the association are directed by a board of trustees of nine members, two of whom are elected each year (only one is elected in the fifth year) by the House of Delegates to serve five years. No trustee can serve for more than two terms. The trustees have charge of the business affairs, the *Journal*, the bureaux, and most of the councils. They cannot however carry out any policy opposed by the House of Delegates and they are responsible to that house for their interim management.

It has been believed that this mechanism provided a thoroughly democratic scheme of organisation and yet allowed the employees to be far enough removed from the vagaries of sudden change to permit efficient conduct of association affairs.

In a series of resolutions adopted over many years but especially accelerated in the past eight or nine, the House of Delegates has registered its opposition to State medicine in the sense of placing physicians as the employees on a salaried basis of any governmental group. They have also opposed some phases of contract practice and some phases of health insurance, especially that kind involving complete prepayment of medical care. The result of these resolutions and the attendant publicity was such as to create a widespread impression among many physicians as well as most laymen that the official national medical body was opposed to all change in the form or character of medical care. This misconception is important in understanding recent developments—e.g., the highly publicised report of the so-called Committee of 430 Physicians. Most thoughtful physicians in the United States are largely agreed on the objectives of improved medical care and the direct patient-physician relationship. It is the method of reaching this end that causes controversy. Practically all are agreed that some people get less satisfactory medical care than present medical science is prepared to offer. There is however much confusion as to the definition of "adequate medical care" and considerable difference of opinion as to whether *ideal* medical care, from the standpoint of present medical scientific knowledge, can be given to all individuals on any workable economic basis.

An example of this difficulty is brought out in a recent report which indicates that patients on relief do not have as much nursing care in the home as patients with incomes of $3000 a year and over. This is cited as an example of "inadequacy." While the nursing care which the latter receive may perhaps be considered ideal it is by no means certain that such care is necessary to constitute so-called adequate care or that the illness of nurseless patients would be any more prolonged or the mortality any higher than the former. Poorer patients tend to receive more hospital care than their richer fellows. There is no doubt in anyone's mind that medical services can be improved and that the demand for such improvement is partly the result of the tremendous strides which medical science has made and in part the result of changed economic conditions. The demand for such commodities as automobiles, radios, and electric refrigerators has increased at the same time as the cost of ideal medical services has risen. The American Medical Association has been in a favourable position to recognise the tremendous pressure which would be put upon the medical profession to endorse changes in the economics of medical care. It has always encouraged localised experiments in the rendering of such care but, because of the resolutions referred to, it has the far-flung reputation of stand-pattism and reactionary policy totally unjustified by the actual facts. Some of your correspondents regard a policy of local experimentation and observation as insufficient. They seem to me to overlook the enormous differences between various sections of the country in economic conditions such as urbanisation, custom, average cash income, and distance. I hold the view that if outside pressure does not become too great at an early date the medical profession will compose most of its differences and will develop methods which, while possibly not ideal, will succeed in furnishing improved medical care to increasingly large numbers.

THE STORY OF HEALTH INSURANCE IN WASHINGTON

Last year, as you reported at the time (1937, 2, 281), the Home Owners Loan Corporation, a federal agency in Washington, set aside $40,000 to establish a system of health insurance for its employees. The Group Health Association Inc. was opened on Nov. 1st, 1937. Dr. R. C. Cabot spoke at the inaugural dinner, emphasising the value of group medicine in diagnosis and treatment. Unmarried employees insure for $2.20 per month; those with families large or small for $3.30 per month. On Nov. 3rd the District of Columbia Medical Society held a closed meeting and next day the press announced that the society was working out a health insurance plan of its own; it was also announced that the society regarded certain aspects of G.H.A. as illegal. On Nov. 12th, according to the *Washington Herald*, two physicians returned from Chicago with the assurance that the American Medical Association "will support the society in any solution finally agreed upon." The District Medical Society, it was reported, was considering a move to close Washington hospitals to members of G.H.A. A few days later a committee of federal employees called upon the society to drop its opposition to group medical service by G.H.A. "What do they want?" retorted Dr. M. D. Hiden of Warrenton, "we give them all our time, we go out at every hour of the night, we give them the hospital of their choice whether or not it is convenient for us." On Nov. 29th Senator McCarran called on the Loan Corporation to explain why it had set aside funds to finance G.H.A., and on Dec. 17th the acting comptroller, General Richard N. Elliott, submitted an opinion to Senator McCarran that the grant of $40,000 was "without authority of law." Nevertheless on Dec. 22nd G.H.A. announced it would seek members in four other branches of the federal government. At that time it

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was said that visits to the clinic averaged from 350 to 400 weekly. On Dec. 31st U.S. district attorney Leslie C. Garnett and corporation counsel Elwood Seal ruled that G.H.A. was operating illegally. Not only was it illegally practising medicine but also it was illegally in the insurance business. At the same time it was announced that Dr. Allen E. Lee and Dr. M. Scandiffio were on trial before the District Medical Society for violation of the society's laws in connexion with their activities in the G.H.A. clinic. On Jan. 4th, 1938, it was announced that 260 new members had been admitted to G.H.A. from two fresh government agencies. On Jan. 7th the Senate's legislative council advised that "it is not clear that the expenditure was one which the corporation did not have authority to make." "The diversion by the HOLC," Senator McCarran rejoined, "may have been legally right but it was morally wrong."

By this time interest in the district was thoroughly aroused and public discussion of G.H.A. became common. In a debate with Dr. T. Swann Harding, Dr. A. B. Bennett of the District Medical Society described the English system as a horrible example: "In England, where they have State medicine," he said, "the government spends $25,000,000 a year for administration of it. The doctors are supposed to treat 28 patients in two hours, which means four minutes to each patient." On Feb. 1st the G.H.A. plan was endorsed by the district branch of the National Lawyers' Guild, which held that the association was not subject to the insurance laws and was not engaged in the practice of medicine. On March 2nd a letter was sent by R. T. Berry, secretary of the association, to officers and trustees of local hospitals inviting them to a meeting, and complaining that hospitals were discriminating against the medical staff of G.H.A. Membership in the association entitled the insured to 21 days' hospitalisation, but it was said that members were being "denied treatment by licensed physicians and surgeons of their own choice in the hospitals of the District of Columbia." On March 17th Dr. Scandiffio was expelled from the medical society; Dr. Lee, it was announced, had resigned from G.H.A. Herbert L. Willett, jr., director of the Community Chest (an organisation for collecting in one campaign subscriptions to all local charities), announced that pledges were being cancelled "because hospitals are refusing to admit G.H.A. doctors." A spokesman for the Loan Corporation told a newspaper writer that social pressure had been exerted on doctors then on the staff or who had contemplated joining it. In one case a G.H.A. doctor, it was stated, was forced to declare that his patient was brought by him in his private capacity, rather than as a G.H.A. member, before the surgeon would operate for acute appendicitis. President Roosevelt on the other hand expressed his sympathy with G.H.A. at a press conference.

In the House of Representatives on March 23rd Representative Scott charged the District Medical Society with endangering the lives of federal employees and their families through its controversy with G.H.A. He reported that a government worker had been turned out of a local hospital, though she was suffering from an acute attack of appendicitis, because she demanded a G.H.A. physician. Two days later the appendix ruptured and she had an emergency operation in another hospital. This charge was denied by Dr. F. X. McGovern for the medical society; at the operation in the second hospital when the appendix was removed it was, he said, neither acutely inflamed nor ruptured. At the present time events seem to be moving rapidly towards a crisis. The Group Health Association is appealing to its friends not to boycott the Community Chest which provides hospitalisation for the indigent but has no control over hospital policy. Another of the association's doctors is on trial by his society in Texas for unethical conduct. A prominent Washington laryngologist, Dr. V. Dabney, who has been a member of the medical society for 30 years, has joined the association's staff. Senator Robert Wagner, offering in the Senate a resolution providing $50,000 for investigating national health problems, expressed his belief that health insurance should have come before unemployment insurance and old-age pensions. Finally the Washington newspapers of April 12th report a letter from the president of the District Medical Society to the president of Group Health Association which reads as follows:—

"These statements suggest that the Medical Society is opposed to such programs and has adopted obstructionist tactics, has refused to cooperate and is trying to block such programs. On the contrary, the Society has long recognized the need for better medical care for persons of low income and we are earnestly seeking a sound, safe, satisfactory solution of the problem.

"The Society is willing to cooperate with any lay group, including Group Health Association, in setting up and carrying out a program to this end. The only conditions are that the programs must be legal, ethical, economically sound and provide service in conformance with recognized medical standards.

"We sincerely believe a program can be worked out under these conditions, which will provide adequate medical care for persons of low income, free choice of physician and a system of regular monthly payments, in the nature of insurance premiums."

MEDICINE AND THE LAW

Must the Surgeon Count the Swabs?

Mahon *v.* Osborne, tried at the Manchester assizes last week, was one of those cases where a swab has somehow been left behind in the patient's body when the wound is closed after an operation. The surgeon had relied on the counting and checking of the swabs by an experienced theatre staff. Where would the jury place the blame? Would they say—as in Byrne *v.* Thorn in 1904—that, if the nurse made a mistake, the operating surgeon was liable because the counting was a vital part of the operation undertaken by the surgeon? Or would they—as in the South African decision in 1924 (Van Wyk *v.* Lewis)—hold the theatre sister to be independent of the surgeon so that any negligence on her part was something for which he should not be made to account? In the end they seem to have said—as in James *v.* Dunlop in 1931—that the surgeon was liable upon the particular facts of the case.

Thomas Mahon, a labourer, was brought to Davyhulme Park Hospital near Stretford on March 4th, 1937. He was suffering from a perforated duodenal ulcer. Mr. R. P. Osborne operated the same day. Owing to the subsequent condition of the patient, the visiting surgeon of the hospital conducted a second operation on June 12th, and a swab 10 in. by 8 in. was found in the body. The patient died next day. His mother brought an action for damages for negligence. Mr. Osborne's defence was that he was assisted by a highly trained nursing staff on whose care and skill he was entitled to rely; there was in use a system by which swabs were carefully

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counted and checked; in the circumstances, he contended, it was not the surgeon's duty, nor was it in the best interest of patients, for him to count the swabs or check the removal; that was the duty of the theatre nursing staff. He had inquired if all the swabs were accounted for; on receiving an answer in the affirmative, he closed the wound. For the plaintiff it was claimed that it was the duty of the man who put in the swabs to take them out. Here there is perhaps a suggestion that the surgeon, in interfering with a patient's body, commits some kind of trespass or assault; but the patient has impliedly invited the surgeon to do what is necessary. On the surgeon's side it was pointed out that swabs are extremely difficult to detect by sight or touch; they may be indistinguishable in colour from the surrounding tissues; the same swab may be used several times in the course of an operation; the surgeon cannot possibly keep a mental note of the number used. This particular swab had no forceps attached. Perhaps the forceps had fallen off; perhaps two swabs were folded together. It was stated that over 3000 abdominal operations had taken place at the hospital and this was the first misadventure of this kind. In accordance with sound standards of hospital practice a tally was kept on a blackboard of the number of swabs used. They were grouped in bundles of five and were checked by the theatre staff before use. Mr. Justice Atkinson pressed Mr. Osborne to give his own theory of the mistake. The witness said he thought there might have been a miscount; possibly two swabs were given him at one time, the one with forceps attached, the other without. Miss Ashburner, the theatre sister responsible for the checking, described the method adopted. By the time the swabs reached the table they had been counted three times. She was not conscious herself of having done anything amiss. Her evidence caused the court to inquire how she came to have omitted to enter a defence in the proceedings. She had originally been made a defendant like Mr. Osborne, but she had put in no appearance; judgment had therefore been signed against her in default and the court had been informed that, so far as she was concerned, the sole duty of the jury was to assess the amount of damages she would have to pay. She gave her own explanation. She had written to Mr. Osborne about the claim made against her, and she had been interviewed by Mr. O. A. Hempson, a partner in the firm of solicitors acting (through the Medical Defence Union) for Mr. Osborne. There had evidently been a misunderstanding. Neither Mr. Hempson nor Mr. Osborne had undertaken her defence. Mr. Hempson indeed made it clear in the witness-box that he would never have advised that the surgeon and the theatre sister should have their case conducted by the same legal advisers. The judge was satisfied that everybody had acted in good faith and that Miss Ashburner, who ought to have taken legal advice, never intended to admit liability. The judgment signed against her was, by consent of all parties, cancelled. But, with the case thus reopened against Miss Ashburner, no specific allegations of negligence were formulated so far as she was concerned nor did the plaintiff's counsel seem prepared to impute blame to her. It was not surprising that the jury eventually found no negligence on her part. Meanwhile expert witnesses had testified to the care and skill of Mr. Osborne. Mr. John Morley, professor of surgery at Manchester University, reminded the court that the surgeon has to balance in his judgment the harm he may do by an extensive search as against the harm he may do by leaving a swab behind. He added that a swab was difficult to detect when saturated with fluid and difficult to discover by touch. The judge told the jury that Mr. Osborne had given his evidence with conspicuous frankness and was a witness who would command their confidence. The jury declared themselves unanimously of opinion that Mr. Osborne was working under difficult conditions during the operation, but they came to the conclusion that he had not made a reasonably sufficient search for swabs and that a search would have disclosed the missing swab. On this finding the plaintiff was awarded £616 3*s.* 6*d.* and costs against Mr. Osborne, with a stay of execution for 14 days pending consideration of appeal. How a jury reaches its unanimous conclusions in questions of such technical difficulty is one of the mysteries of our forensic system. Possibly an actual experience of the surgeon's task in the operating theatre would go far to convince juries that counting swabs at the close of an operation is not so simple a matter as counting the number of persons on a bench in the law courts and that other considerations may make it impracticable to explore the patient's body at leisure. In effect the verdict in Mahon *v.* Osborne means that a surgeon is not to delegate the task of checking the swabs to the sister who is trained to undertake it, but that he must somehow keep count of every swab while his mind is intent upon the all-engrossing complexities of the operation. The verdict does not seem to suggest that the surgeon is responsible for the sister's possible error, so much as that he himself must do everything.

RESPONSIBILITY FOR NURSES

A legal journal, in a preliminary comment on Mahon *v.* Osborne, observes that the reports of the case do not disclose the exact status of the Davyhulme Park Hospital. "We must presume," adds our contemporary, "that nothing at all, either in law or in fact, could be said against its owners." This remark may serve to link up the case with recent discussion at the Stowmarket District Nursing Association, where it was suggested that the employing body might be well advised to declare that it accepted no liability for claims made on the basis of the alleged negligence of a nurse. The public health department of the East Suffolk county council had written to point out the need of adequate insurance against possible claims. It was said that a recent action had resulted in damages being awarded against a cottage hospital to the amount of £3649 on the ground of the alleged negligence of the staff; the hospital had been insured, but the policy provided that the maximum payable on any one claim should be £1000. Thus a substantial sum had to be found from other sources. To disclaim liability for the negligent acts or omissions of its servants and agents may not be easy for a nursing association. While the parallel may not be exact, the London Passenger Transport Board could hardly protect itself from claims made by injured pedestrians by merely announcing that it would not in future hold itself liable to pay damages for traffic injuries caused by the drivers of the Board's vehicles. The law of agency and the principle of *respondeat superior* are too strong for that.

Mistake in Dose of Sleeping Draught

The risks of consultation by telephone were revealed at the inquest on Lady Rankeillour on April 28th. A patient had been suffering from shingles; her

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teeth had been extracted and she was under the care of a nurse who had been attending her since last November. Her medical attendant was paying her a visit once a week. The nurse, to summarise the evidence she gave at the inquest, telephoned to the doctor that the patient was unable to sleep. She asked his advice and mentioned the possible use of paraldehyde about which he had spoken some time before. She understood the doctor to say that she should give 6 oz. in 8 oz. of paraffin. She had not given paraldehyde to a patient for 16 years and she did not remember the dose. She wrote down what she understood to be the doctor's direction. She asked if she could obtain it without a prescription and he said "Yes." She then asked a chemist for 20 oz. in a bottle. She administered the dose of 6 oz. in paraffin by the mouth before giving ⅛ gr. of heroin by hypodermic injection. She found next morning that she could not wake the patient. The doctor was hurriedly communicated with and he at once denied that he had ordered a dose of 6 ounces. He was sure that he had said "6 drachms" over the telephone, while the nurse evidently had no doubt that he had said "6 ounces." Dr. John Taylor, pathologist, who stated that death was due to syncope, informed the coroner that the official dose by the mouth was from ½ to 2 drachms. The coroner repeatedly pressed the nurse about the disappearance of the piece of paper on which she had written down the doctor's instructions. The witness, who was naturally distressed, could say no more than that she had torn it up. After all, as she pointed out under pressure, the note was in her own handwriting and she could have written another one if minded to deceive the tribunal. The family of the deceased generously abstained from accusing any of the parties of negligence. The inquest brought out the fact that paraldehyde is neither a poison on the Poisons List nor a dangerous drug within the 1920 Act. There are no restrictions in obtaining it. The chemist who supplied it was understood to have told the nurse that 6 oz. was a large dose and that he thought the maximum was 2 oz. He was aware that it is a drug which is somewhat flexibly administered.

INTERNATIONAL CONGRESS OF LEPROSY AT CAIRO

THE first three leprosy conferences on an international scale were held in Berlin, Bergen, and Strasbourg, the last of these being held fifteen years ago. At these conferences important agreements were arrived at. In 1931, through the generosity of the American Leprosy Foundation, a meeting of a limited number of experts was held in the Philippines. This latter took the form of a round-table conference, and after three weeks' deliberations a classification and terminology of leprosy was arrived at which has been generally accepted and which has done much to get rid of the confusion which formerly surrounded this difficult subject.

The fourth international congress was held in Cairo from March 21st to 27th, under the patronage of King Farouk, who opened the first session. Subsequent sessions were held at the faculty of medicine of the University of Egypt.

The scientific side of the congress was organised by the International Leprosy Association. Important workers in leprosy from nearly all countries where leprosy is a serious problem accepted the invitation to attend. Fifty countries in all were represented, most of them by official delegates. After that of Egypt itself the largest delegation was from Brazil, where much excellent anti-leprosy work has been done during the last few years.

The aim of the congress was to combine as far as possible the international and round-table modes of procedure. Papers were read and discussed at the morning sessions, while four subcommittees made up of exponents known to hold different views met in the evenings to thrash out important aspects of leprosy: classification; treatment; endemiology and control; and in-vitro cultivation of *Mycobacterium lepræ*. It was proposed (*a*) as far as possible to reach agreement on matters in dispute, and (*b*) failing agreement, to formulate common methods of procedure along which all could work, and common methods of record which would make it possible to compare results obtained in different places. In spite of the short time available, satisfactory progress was made, and the lines have been clarified along which concerted action should be taken before the next congress five years hence. Resolutions based upon the reports of the first three subcommittees were adopted by the congress and will be published shortly in a special bulletin.

The papers read at the congress were divided into six sections, one whole session being devoted to each: geographical distribution and epidemiology; clinical types and classification; research, including cultivation and inoculation of the leprosy organism; treatment; methods of control; miscellaneous, including rat and buffalo leprosy.

DISCUSSIONS AND COMMUNICATIONS

Differences between types of leprosy. — Among many aspects of interest and importance raised perhaps the most outstanding was the difference between the two main types of leprosy. The term "cutaneous," as applied to one of these types, has now been definitely abandoned in favour of the term "lepromatous." There is general agreement that the lepromatous type of lesion differs widely from the neural and especially from the tuberculoid. This difference extends to all aspects of leprosy. The clinical and histological pictures are distinct; the prognosis is much more favourable in the tuberculoid; the lines of treatment differ in the two types, as do also the methods of control. The tuberculoid type of lesion, at first supposed to be confined to one or two countries, is now recognised to have a much wider distribution; it may, in fact, be the commonest type.

In the discussions on *treatment*, the primary importance of general physical improvement was again emphasised. It is recognised that the principal predisposing causes may vary in different places; also that the disease may take on a severer form and be less amenable to treatment in some places than in others, though whether this is due to physiological, sociological, or economic differences is not yet clearly determined. The oils of the various chaulmoogra or hydnocarpus species still hold first place under special treatment. Reports were given from various centres where better results had been obtained with larger doses of the oil or esters, as much as 20 c.cm. or more being given subcutaneously per week. These larger doses are now made possible by the pure quality of the oil prepared from carefully selected seeds. French workers reported promising results with a new preparation, a combination of chaulmoogra and cholesterol which, in the form of a fine emulsion, is given intravenously.

Epidemiology.—One of the most important aspects of leprosy centres round methods of conducting leprosy surveys and recording results. The findings

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of the subcommittee on epidemiology should gradually produce in coming years a harvest in the form of comparable reports from widely varying endemic countries. It may then become possible to determine whether leprosy is increasing or diminishing in any area surveyed, and what are the principal factors governing incidence.

Much interest was called forth by a paper read by Dr. M. H. Soule (Ann Arbor, Mich.) on in-vitro culture of *M. lepræ*. He has now succeeded in carrying on a slow-growing culture through 60 series of subcultures. Controls with heated lepromatous material produced scanty numbers of organisms by "carry over" only to six subcultures. Ordinary media are used, but the results are apparently due to the carefully regulated pressure of oxygen and carbon dioxide under which the cultures are kept. Unfortunately other experienced workers who have used Soule's methods have so far failed to confirm his results.

Dr. S. Adler (Jerusalem) made a communication on the inoculation of splenectomised Syrian hamsters with *M. lepræ* (see *Lancet*, 1937, 2, 714, 834) and by the microscopic slides demonstrated. There seems little doubt that human leprosy has been transmitted successfully to these animals and that the bacilli have multiplied considerably. It is still too soon to know whether progressive disease will result and whether the infection can be transmitted through successive series of animals. If this proves possible we may find ourselves possessed of a new method of testing the chemotherapy of leprosy.

During the course of the congress the first general meeting of the International Leprosy Association was held. This association, formed in 1931 at the conference in the Philippines, includes in its membership the leading leprologists throughout the world. The appointment of its new president, Prof. E. Marchoux, is particularly appropriate, as the next international leprosy congress will be held in Paris in 1943. Comment was made on the value of the *International Journal of Leprosy*, the organ of the association, to workers throughout the world. Its publication is made possible by the American Leprosy Foundation which, besides giving generous grants, lends the part-time services of the editor, Dr. H. W. Wade.

Perhaps the most valuable aspect of this congress was the opportunities it afforded for personal meeting of workers all over the world. Leprosy is among the most difficult and baffling of all diseases, and these personal contacts are likely to remove many misconceptions and misunderstandings, and prove a valuable stimulus to international coöperation.

All agreed that the congress was an outstanding success and gratitude was expressed to the Government of Egypt for undertaking its organisation on the general and social side. Much hospitality was offered and good arrangements were made to enable members to visit scientific institutions and places of historic or other interest.

PANEL AND CONTRACT PRACTICE

Treatment "in respect of" a Confinement

EIGHTEEN years after the terms of service were incorporated in the medical benefit regulations, Clause 8 (3) still provides that the treatment which a practitioner is required to give does not include treatment in respect of a confinement, that is to say, attendance in labour resulting in the issue of a living child, or attendance in labour after 28 weeks of pregnancy resulting in the issue of a child, whether alive or dead, or attendance within 10 days after labour in respect of any condition resulting therefrom. A practitioner has just interpreted this clause as meaning that he is not required to give any service in respect of the condition of pregnancy if it lasts 28 weeks, but as he realises he cannot be sure in advance that the pregnancy will extend to 28 weeks he is seeking to apply his theory only in cases which have attained that period. In order to test his reading of the terms of service he has charged two insured women one shilling each for private certificates of incapacity, although each of the women applied for a N.H.I. certificate. No question arose as to their incapacity or otherwise.

The case was investigated by the medical service subcommittee which summarised the practitioner's contentions as follows:—

(1) That a practitioner is not liable for the antenatal care at any stage of pregnancy which is going to result in the issue of a living child; (2) that a practitioner is not liable for the antenatal care of a pregnancy which, after 28 weeks, results in the issue of a child, whether alive or dead; (3) that a practitioner is not liable to provide attendance in labour after 28 weeks of pregnancy.

As regards the third contention there was no difference of opinion, but after giving careful consideration to the first two contentions the committee felt they had no alternative but to reject them. In their view the practitioner is required to provide any necessary treatment up to the actual onset of labour—a view which coincides with what has been established custom. The basis for the practitioner's contention is, it seems, that all the words after "that is to say" are a definition of the word "confinement"; the committee regard them as a definition of the phrase "treatment in respect of a confinement." Thus the committee would say that the treatment which a practitioner is required to give "does not include attendance in labour . . ." while the practitioner would substitute "does not include treatment in respect of an attendance in labour. . . ."

A while ago correspondence on a hypothetical case of this sort instanced a woman who goes to her doctor and requests him to attend her in her confinement. The writer claimed that all the things the doctor would do, both before and after labour, would be treatment in respect of the confinement, and this seems to sum up the point of view of the practitioner in the present case. "Medical Insurance Practice," after setting out the gist of Clause 8 (3), goes on to say that it follows that antenatal care and the treatment of any conditions not arising out of labour are covered by the general obligation imposed on an insurance practitioner to give, free of charge, to an insured person proper and necessary medical services within the competence of a general practitioner. And until the present claim this was the view universally held.

The insurance committee adopted the recommendation of its subcommittee that the practitioner, having committed breaches of the terms of service, should be required to refund the fees paid for the certificates of incapacity. He has the right of appeal to the Minister of Health.

GESELLSCHAFT DEUTSCHER HALS- NASEN- UND OHRENÄRZTE.—Dr. Herbert Birkett (Montreal), Dr. Brown Kelly (Glasgow), Dr. D. R. Paterson (Cardiff), and Sir StClair Thomson (London) have been elected honorary members of this society.

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GRAINS AND SCRUPLES

Under this heading appear week by week the unfettered thoughts of doctors in various occupations. Each contributor is responsible for the section for a month; his name can be seen later in the half-yearly index

FROM "SILVER DOCTOR"

I

Surreptitious scruples, gyroscopic grains
Levitate our *Lancet*, syncopate its strains:
Doctors, *do* be cheerful, cultivate a smile,
Drop that wise expression—be yourselves a while!

* * *

THERE is a kindly ring about this title "Grains and Scruples." The word "Grains" encourages a hope that our Editor is a charitable person who does not despise small things and may not expect too much from his contributors. "Scruples" strikes another comforting note but is withal somewhat tantalising in its vagueness. Does it refer to the ancient pennyweight of the apothecary, the equivalent of twenty grains, or is it a sly hint that these paragraphs must never depart from the rules of the immortal Cocker? In either case an unscrupulous LANCET is unthinkable, and its hallowed title—refined from the common or surgical "knife"—recalls the benevolent atmosphere of frock-coats and gold-headed canes. Honi soit qui mal y pense.

* * *

Twenty-five years as physician on the staff of a London teaching hospital is a fair innings, during which one has had to play the game on every sort and kind of wicket and keep a straight bat against an endless variety of bowling. Not the least remarkable development of this wonderful twentieth century is the world-wide rise of a national and international health-consciousness. Any and every angle and corner of the healing art has become the subject of unceasing public and private discussion. The importance of health as a national asset is recognised at its true value, and to-day "be fit" is boomed as the greatest of all commandments. Constituted British authorities, such as the Royal Colleges and the General Medical Council, have awakened to a sense of their responsibilities, a live British Medical Association prods the practitioners, and a vast Ministry of Health pours out millions in social services for all. The old order changes with a vengeance and maybe this is only a beginning.

Previous writers in these columns have discussed such great issues as the fate of the voluntary hospital system, the virtues of whole-time hospital staffs, and the inadequacies of medical education. There comes a time when the most serious of us grows a trifle sated with the vehemence of the reformer's thunder. Meanwhile income-tax rises, school bills must be paid, and the consultant survives in spite of innumerable kicks among his occasional guineas. But it is difficult to withstand the tendency of the age and I have no doubt that later on I shall be betrayed into an earnest attempt to set out my views on the needs of the times. It may be permissible, first, to discuss some of the minor incidents, just the ordinary noughts and crosses, which infest the path of the physician of to-day.

* * *

What a pity that so few physicians on the honorary staffs of hospitals stick to their own job. Surely it should be a cardinal rule that he does not see a patient in a patient's home except with the family doctor, and that he never treats a private patient but always writes his opinion to the general practitioner. Aut Cæsar aut nullus! One or the other, consultant or practitioner, but it is neither fair nor proper to act as both. On the lowest of all grounds it is a mistake, for it doesn't pay, since the profession soon learns to trust the pure consultant who refuses to usurp the position of the family doctor. Similarly what a fool is the practitioner who objects to a consultation. Every patient has the right to a second opinion, and if an invalid is not improving, the two-heads-are-better-than-one principle is common sense.

* * *

The matter of fees is a recurring bugbear. The amount of a consultant's fee is definitely fixed, but there are instances where it is right that it be reduced. Unfortunately there also are mean people who seek to evade their due responsibilities. It is a sound rule for the consultant to leave the fee question to the family doctor who is better able to assess the patient's finances. At the request of the practitioner (but not the patient) I made it a rule to accept half-fees, and if any patient could not afford this I saw him for nothing. This plan worked admirably and saved unpleasant haggling. Once (but only once) a worthy fellow asked permission to pay a double fee and I regret still the silly pride which forbade its acceptance; there was one, too, who quibbled as to whether he should pay two or three guineas but jumped at my suggestion of "double or quits," and thank goodness he lost! Fees from relatives of medical men may present difficulty. Doctors always have prized the privilege of giving their services to colleagues and their families, but there is a fringe of in-laws, uncles, aunts, and cousins for which undue advantage may be claimed. Fees from such cases should be accepted when they are in a position to pay. In an experience of hundreds of these people I refused any payment, but this was unnecessarily quixotic, and the net result was an array of silver-plate for one's servants to polish and a collection of impossible cigars! Since retirement I insist on paying half-fees for medical services to my family or myself and this seems a reasonable practice.

* * *

Of late the public conscience has been harrowed by stories of fee-splitting physicians and money-grubbing surgeons, men who consider their own pockets before their patients' interests. I take this opportunity to record that during my long years of consulting practice there was but a single occasion when any suggestion (and that a very minor one) of such a crime came under my ken. I do not believe that there exists a more high-principled body of men than the doctors of Great Britain.

* * *

Retirement, the voluntary resignation from active work while one is still capable of duty, is a more or less modern conception. Savages always have disposed of their aged in no uncertain way. In medieval times men continued the fight for existence till they dropped, or the other fellow dropped them. Provision for old age by thrift or insurance was unborn, and the autumns and evenings of life were rare and uncomfortable affairs. The greatest of all books tells us "The days of our years are threescore and ten; and if by reason of strength they be fourscore

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years, yet is their strength labour and sorrow." Old men were a nuisance to themselves and everyone else. In my youth it was the fashion to speak of "dying in harness" as a glorious ideal. To-day all this is changing. The expectation of life has increased and still grows, and the urban urge throngs our cities with young men tumbling over one another in the struggle for the prizes in every walk of life. Nowadays the race is to the young, and too old at 60, 50, or even 40 is a common cry. Men are required to resign important commands at a fixed age, pensions have become a recognised provision, and the State makes an allowance for every citizen who survives 65.

Medicine has had to toe the line. Hospital authorities insist on an age-limit for their staffs, and the public has ceased to regard senility as the touchstone for medical wisdom. This is as it should be and makes for fitter physicians and surgeons. Medicine is a strong man's job. There is something out of place in the picture of the ageing physician of whom it is whispered (however affectionately) that he is "getting past it." Old age begets slackness and slackness may have tragic consequences in dealing with human lives; indeed it might be a good law which forbade the doctor over a certain age to practise at all.

Consultants seem to react slowly to these necessities and many hang on overlong to practice: some frankly funk retirement and wonder how they will fill their time. The answer is obvious. Every man, and especially every doctor, should cultivate a hobby during his working years which will enable him to look forward to retirement as a time when he will have leisure to devote to its enjoyment. After ten years of retirement I can vouch for its delights. Gone are those days of unending rush from one job to the next with one eye on the clock and the other on one's appointment-list. No more scamped meals and no longer does the telephone-bell strike a note of terror. Each morning after breakfast a man may light a pipe and read his newspaper in peace. Dreams of travel have come true, one has caught fish in many waters, there is time to read, the opportunity to think, and THE LANCET is digested on the day of its arrival! What more can a man desire?

Some readers of these lines will be shaking their heads: "All very well, my dear man, but you have been lucky and it is impossible to save money in these days." It is true that the consultant requires what is known as luck in certain directions, the luck of good health and the luck to possess a capability for hard work, but the rest is largely in his own hands. Any man on the staff of a teaching hospital can look forward to sufficient practice to enable him to save money, provided that he sticks to his job and lives carefully. Aye, there's the rub! Are our young physicians content to be economical and does the Queen Anne-street cobbler keep reasonably close to his last? What about those modern "week-ends" and the ever-increasing evening "shows," and to-day who thinks of "taking care of the pence"? A country cottage and a second car seem to be regarded as necessities, the golfer must join a seaside club, and every sportsman expects his Scottish fishing or his gun in a syndicate-shoot. That's the way the money goes and "easy come and easy go" is too often the motto of Harley-street to-day. It is an axiom of sound finance that every man should put aside a percentage of his income, but how many physicians keep any record of their expenses? If consultants would cut their coat according to its cloth and invest a yearly saving in gilt-edged securities, retirement at a reasonable age on a modest competence should with any luck be still possible, and by Heck the game is worth the candle!

PUBLIC HEALTH

An Epidemic of Poliomyelitis

IN the stress of medical and administrative preoccupation with the epidemic of poliomyelitis which began in Melbourne last June there was at first little time to prepare any detailed account of its behaviour. Now, however, much interesting information can be gathered from a full report of a symposium held by the Victorian branch of the British Medical Association at Melbourne,[1] and from articles contributed to the State health bulletin[2] by officers responsible for different phases of administration. The season of onset of this epidemic has already been the subject of wide interest. Apart from minor rises in the spring, and small trailer outbreaks recorded in the United States in autumn and winter, the only serious epidemic which appears to have fallen outside the normal summer season was that in Sweden in 1911, where there were 3840 cases, with 380 deaths, between October and December. The Victorian epidemic began in the antipodean midwinter and gathered impetus up to the end of the year. In Melbourne the decline began almost six months later, at midsummer, but abatement was delayed in extra-metropolitan parts of the State for another month. The most favourable time of the year for poliomyelitis, the late summer and autumn, seems to be passing without exacerbation.

By Australian standards the virus has been unusually damaging although Dr. John Dale, medical officer of health for Melbourne, says that it was not comparable in lethality to that of the strain causing the epidemics in New York in 1916 or New Zealand in 1916 and 1924. He found no evidence that it was more infectious; but this is a property of communicable disease, as distinct from virulence, which is always hard to measure, and especially in a disease like poliomyelitis in which the extent of latent immunisation cannot be determined by simple laboratory methods. The age-distribution of cases, which might be an index of infectivity, has certainly not been unusual: 96 per cent. of those affected were under fourteen and 83 per cent. under ten, with the peak incidence at six years of age in the inner suburbs of Melbourne but rather later elsewhere. The excess of male cases has been a little higher than usual, these representing about 60 per cent. of the total. Among 109 children, contacts with older cases carefully watched in his own area, Dr. Dale detected 7 definite paralytic cases and 11 which were regarded as abortive, but he thinks that this rather heavy incidence may have been attributable to familial susceptibility combined with a high degree of exposure. The incubation period was not less than seven days and ranged usually from eight to twelve.

Some useful observations on the early diagnosis of poliomyelitis have been made by Dr. Mostyn L. Powell. Cough or coryza was rare and, except in cases of pharyngeal paralysis, had to be regarded as evidence that the illness was not poliomyelitis. (Fortunately from the diagnostic standpoint, concurrent colds and poliomyelitis were uncommon in this epidemic, and indeed, Dr. F. V. Scholes, medical superintendent of Fairfield Hospital, reports an

[1] *Med. J. Aust.* Feb. 26th, 1938, p. 402.
[2] State of Victoria, Commission of Public Health (295, Queen-street, Melbourne): Health Bulletin Nos. 51 and 52, 1937.

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exceptionally low incidence of all the other infections, a factor which eased the hospital situation.) Dr. Powell also refers to the rarity of the diarrhœa so often mentioned in text-books. Severe acute unilateral pain, and especially tenderness, were more likely to be due to other causes; the pain of poliomyelitis might be severe enough at times but was usually dull and not much increased by palpation. Rigors and rashes were quite exceptional. Mental clouding was rare and brief. Although no positive sign or symptom could be regarded as truly diagnostic, a coarse intention-tremor was highly suggestive. There was almost always a background of headache, some drowsiness, lassitude, and possibly fever of some days' duration. The value of lumbar puncture was limited, and it may be mentioned that earlier observers have regarded this procedure as not without risk in suspected incipient or abortive forms of the disease.

As to the period of observation required in abortive cases, Dr. Scholes found no case in which paralysis developed more than twelve days after the onset of symptoms. He gives clear instances of hospital infections arising by contact with cases so anomalous as to be almost undiagnosable. His contributions both to the discussion and the government report are of special value in connexion with the practical problems of hospital administration. Of these the most urgent was the supply of respirators of a type resembling, but not identical with, the Drinker apparatus. These were devised by, and produced under the supervision of, Prof. Burstal of the faculty of engineering. The electricity supply was duplicated in case of failure. About 40 patients were receiving respirator treatment at one time, some continuously, others intermittently. Altogether 23 respirators were in use for these patients and two ward-blocks of 24 beds each were specially reserved for them. Of the patients in respirators 26 died, pharyngeal paralysis being the commonest cause. Up to Jan. 28th 1159 patients had been admitted to Fairfield Hospital, and 68 of these had died.

From the outset the risk to nurses was recognised, and those with five years' experience (and therefore probably of immunising exposure) were selected for the poliomyelitis wards. They took no special precautions; but younger nurses in wards set apart for other diseases had to wear respirators because of the risk they might run from occult cases. One nurse did have a mild paralytic attack and another had vague symptoms, ultimately attributed to poliomyelitis since she formed a link in a chain of infection.

Up to the end of January 1214 cases had been reported in Melbourne and 556 in the rest of the State. There was public alarm and the education department was faced with the problem of school closure. It was adopted at the outset in Melbourne, but soon modified to apply only to younger children. While it is believed that segregation of their children by parents reduced the incidence or delayed the spread so as to make the epidemic manageable, school closure, in towns at least, was considered of doubtful value. On the other hand, children were regarded as the chief vectors, only occasional circumstantial evidence of transmission by adult carriers being found.

Mental Health in Scotland

The General Board of Control for Scotland, in their report for 1937 [1] state that they had official cognisance of 19,687 insane persons, an increase of 56 during the past year. Of these, 16,874 were maintained from the rates, 2727 from private sources, and 86 at the expense of the State. Progress has been made in the treatment of general paralytics by induced malaria. Many patients have had the disease arrested and have been discharged, and the mortality from neurosyphilis has decreased from 201 in 1921 to 67 in 1936. It has also been found possible to give malarial treatment in general hospitals to early cases and so make it unnecessary to remove them to the overcrowded wards of the mental hospitals. This treatment has diminished the number of beds required for these patients. Hypoglycæmic shock from insulin and injections of Cardiazol are being increasingly used in the treatment of schizophrenia. Two research institutes, one in the east of Scotland and the other in the west, are assisted by Treasury grants and have provided valuable service in collaboration with the medical staffs of the mental hospitals. Scientific investigation in the asylums themselves is greatly restricted by the insufficiency of the medical staff. The shortage of nurses is acute in some districts. Many asylum authorities have made efforts in recent years to improve the conditions of work. They have provided nurses' homes on modern lines with arrangements for study and recreation, and single rooms attractively furnished. Many authorities have introduced a forty-eight hour week, and others have reduced the hours of duty. The Board are among those coming forward with suggestions for improvement of conditions in various directions in order to relieve the shortage of nurses. Food, they consider, might be more varied and served more attractively, and more adequate time might be allowed for meals. Better opportunity for recreation and amusement should be provided. One mental hospital has introduced a break during duty hours, with good results. The Board admit that the shortage may be mainly due to the long hours, and that an eight-hour day and more generous annual leave might attract recruits.

Scotland has the same trouble as England in finding accommodation for mental defectives, and most local authorities have been slow to carry out their statutory duties. The Board are trying to bring about combinations of district by persuasion, as they have no statutory power to direct them.

[1] Twenty-fourth annual report of General Board of Control for Scotland. Edinburgh: H.M. Stat. Office. 1938. Pp. 47. 1s. 6d.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED APRIL 23RD, 1938

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 1864; diphtheria, 1048; enteric fever, 21 (26 "expected"); pneumonia (primary or influenzal), 1212; puerperal pyrexia, 199; cerebrospinal fever, 21; acute poliomyelitis, 3; acute polio-encephalitis, 3; encephalitis lethargica, 2; dysentery, 63; ophthalmia neonatorum, 88. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on April 29th was 5167, which included: Scarlet fever, 775; diphtheria, 1132 (carriers 42); measles, 1975; whooping-cough, 287; puerperal fever, 17 mothers (plus 10 babies); encephalitis lethargica, 283; poliomyelitis, 1. At St. Margaret's Hospital there were 24 babies (plus 11 mothers) with ophthalmia neonatorum.

Deaths.—In 126 great towns, including London, there was no death from small-pox or enteric fever, 40 (4) from measles, 3 (1) from scarlet fever, 16 (2) from whooping-cough, 30 (2) from diphtheria, 47 (11) from diarrhœa and enteritis under two years, and 56 (6) from influenza.

Measles was fatal in 28 great towns, Hull and Liverpool each having 4 deaths. Birmingham reported 4 deaths from whooping-cough, Salford and Wolverhampton each 2. Diphtheria was fatal in 22 great towns; Liverpool and Birmingham each reported 3 deaths.

The number of stillbirths notified during the week was 268 (corresponding to a rate of 39 per 1000 total births), including 46 in London.

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CORRESPONDENCE

AN OVERCROWDED PROFESSION?

To the Editor of THE LANCET

SIR,—Your leading article of April 23rd was, if I may say so, misleading. The comforting figure of 187, which you state is the number of medical refugees who have been allowed to follow their profession in this country, represents only those who have been admitted to the Medical Register. It does not include, however, that further considerable number who are living in this country as students and research workers, all of whom are potential practitioners and many of whom receive scholarships and grants which previously benefited British medical men. I am, Sir, yours faithfully,

London, May 2nd. M.B., M.R.C.P.

To the Editor of THE LANCET

SIR,—I am sure that every member of the medical profession will agree with "M.D., M.R.C.P." in his strictures concerning the inadequate remuneration that continues both in hospitals and general practice; but by juxtaposing this chronic problem beside the completely separate one of medical refugees, your correspondent's letter may give the impression that the former is in some way connected with the latter. This is surely not the case. Doctors were paid no better in the years preceding 1932, when there were no refugees from Germany and Austria to worry us, than they are now. The presence of a mere handful of refugees amidst our multitude of 50,000 cannot affect the general level of salaries distributed. Should no further refugees be admitted and even were the 187 who are already here expelled, the L.C.C. would still bravely advertise the "magnificent salary" of £325 for A.M.O.'s in its mental health service.

The causes of underpayment are, unfortunately, not so simple. Not until the local and other authorities (ultimately the public at large) will fully recognise the value of the services that are and could be rendered by their medical employees, can the position be at all improved; and the education of the public is a slow, painful process. Tradition makes the medical profession loth to advertise its worth, though the British Medical Association has recently decided to break away in certain directions. I maintain, Sir, that if a serious attempt were made to supervise the physical and mental health of the community both from the preventive and curative aspects on the fullest scale, far from there being too many doctors available it would be found that there is a dearth of the numbers required. To take my own specialty, recent correspondence has revealed that many mental hospitals are understaffed, so that after getting through the routine work medical officers find little or no time for studying recent advances or occupying themselves in research work. Many provincial hospitals still lack mental clinics, and in those that possess them the visiting physicians often complain that they are unable to cope with the volume of work satisfactorily. A similar state of affairs no doubt exists in other specialties. As far as the general practitioner is particularly concerned, the solution of our problem lies in extending the scope of the national health insurance system and increasing the inadequate capitation fee. Here I am spared from going into details as a generous scheme is fully outlined in "A general medical service for the nation" appearing in this week's supplement of the *British Medical Journal*.

Such are the measures which, whilst benefiting society, would at the same time materially improve the financial status of every member of the medical profession; whereas the absence of a small number of refugees, whilst helping the very few who have suffered from the "competitive foreign glamour," would benefit neither the public nor the vast majority of our profession.

I am, Sir, yours faithfully,

April 30th. M.D., D.P.M.

To the Editor of THE LANCET

SIR,—Some of your correspondents think that our duty is to leave to their fate members of the medical profession abroad who, by reason of their political philosophy, their race, or merely because they are exponents of scientific theory distasteful to existing authority, have been deprived of their livelihood and threatened with arrest. Others suggest that they should be provided with work in less developed parts of the world where medical services are most needed, rather than allowed to work and live in Great Britain.

If I were to be suddenly robbed of my work, in danger of physical ill-treatment and possibly of a brutal death, and feared for the safety of my family, I would jump at any opportunity of a safe living. I do not doubt that the persecuted doctors of Austria and Germany would do so too. But the proposal needs definition. Who is to pay the salaries of the exiled doctors who go to practise among the untended millions of India, Africa, and China? The people themselves cannot; their extreme poverty is the reason why these regions are undeveloped and without medical services. Which is the most difficult thing to do, to give leave to practise here, or to raise funds to send them abroad? And would not Indian doctors perhaps be justified in using your correspondents' own arguments against "unfair competition"?

As your admirable leading article of April 23rd makes clear, the "dilution" of the medical profession in this country by exiles from abroad is really infinitesimal. The profession is almost unique in the security of livelihood which it affords; there is no genuine unemployment at all. I know of no other occupation which offers such an absolute certainty to its active members of a secure and comfortable life. Yet there are tens of thousands of people in Great Britain who go without adequate medical attention. The organisation of efficient medical services which will cover all persons fully, from birth to old age, is a task which government must very shortly face; it will demand something very like a doubling of the numbers of active practitioners.

But one must remember also that many of the exiles are people who really have achieved distinction in their profession, whose qualities ought to be used in specialised work; the attack on the Jews, of course, has as one of its main motives the jealousy of the less successful and intelligent.

The correspondence on this subject makes one rather melancholy. One expected that the medical professional ethic would have been strong enough to withstand the childishly perverse propaganda which has allowed the German people to return to the abomination of antisemitism. It is dispiriting to find doctors giving unblushing justification to the critics of medicine in Britain who say that it is merely a competitive trade like any other, with profit as its mainspring. Can we not follow the lead of the Medical Peace Campaign in declaring and acting upon the belief that science, and above all medicine,

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has no barriers of race, language, or religion, and that its practitioners are ready to make sacrifices to help each other in distress?

I am, Sir, yours faithfully,

DUNCAN LEYS.

Selly Oak Hospital, Birmingham, April 30th.

HEARING-AIDS FOR DEAFNESS

To the Editor of THE LANCET

SIR,—I must express my disagreement with Mr. Yearsley's statement in your correspondence columns of April 16th that "the permanent use of an aid slowly but surely increases the deafness." On the contrary, it is surely a common experience that the hearing of a patient deteriorates quickly from disuse when he becomes too deaf to hear general conversation and gives up the effort of listening. If at this stage he takes to an aid which enables him to hear conversation, this bad effect is avoided. Mr. Yearsley thinks that impairment of function is caused by the use of an aid, whereas in my opinion it is the relinquishing of the listening effort which produces the impairment of hearing, and this lack of use can be surmounted by a suitable aid. He rightly considers that listening exercises are important, but in cases of severe deafness these can most usefully be performed with the assistance of a hearing-aid and have been shown by audiometer tests to bring about an improvement of hearing. Mr. A. E. Stevens's remarks in your last issue on teaching deaf school-children by means of speech amplifiers corroborate this point.

In their report to the Medical Research Council, which you summarised early in last year, Dr. and Mrs. Ewing and Dr. Littler say that daily use of a powerful hearing-aid over a prolonged period has not been followed by any change in auditory acuity, and they also lay stress on the great value of a class amplifier in the teaching of deaf children.

The possibility of damage to the remains of their hearing is just what many deaf people most fear, and it is to be regretted that Mr. Yearsley's letter may increase our difficulty in persuading patients to avail themselves of the great help often to be obtained by a suitable aid.

I am, Sir, yours faithfully,

HAROLD BARWELL.

Queen Anne-street, W., April 30th.

DIASTOLISATION

To the Editor of THE LANCET

SIR,—In his paper on diastolisation in catarrhal conditions of nose and middle ear in children Mr. Arthur Miller has done well to revive interest in a useful—if somewhat unfortunately named—method of treatment. One only wishes that the technique had been described in greater detail. Does Mr. Miller compress the bulb once or a number of times, by separate efforts, or does he impart to it a rhythmic continuous movement over a period of so many seconds or minutes?

Gautier's original description is also rather indefinite, and for that reason I have utilised an electric oto-masseur as a source of energy. The rapidly successive alterations of pressure within the tube produce a kind of intranasal massage. Since reading Gautier's original article in 1924 I have employed the method regularly with encouraging results in selected cases, although perhaps my technique should not be regarded as "diastolisation" at all.

I am, Sir, yours faithfully,

Edinburgh, April 27th. DOUGLAS GUTHRIE.

ALCOHOLIC "BERI-BERI"

To the Editor of THE LANCET

SIR,—Your issue of April 9th contains an interesting account by Dr. Norman Price of a case of congestive heart failure associated with alcoholism and polyneuritis, and the suggestion is made that lack of vitamin B_1 was the cause of the condition.

This hypovitaminosis is a recognised factor in the case of the continuous drinker and may well be the cause of the associated polyneuritis; but has alcohol itself, in large doses, no deleterious effect on heart muscle and on the peripheral circulation? Dr. Adolphe Abrahams quotes Starling as having shown that alcohol has a depressant action upon the mammalian heart, dilatation of the ventricles occurring if the percentage of alcohol in the blood reaches 0·06 (*Lancet*, April 16th, p. 900). Alcohol is a vasodilator and "as soon as it reaches the blood stream peripheral dilatation causes both (systolic and diastolic) pressures to fall" (Halls Dally, "High Blood Pressure," 1931). There is thus a possibility of both central and peripheral circulatory failure due directly to the action of alcohol.

All alcoholics are not continuous drinkers. Of 317 individuals under my care as resident patients in an institution for alcoholism, over 70 were of the irregular or periodic type, and between their bouts were in normal physical health, showing no obvious signs of cardiac lesions or hypovitaminoses. Yet some of these were at times gravely ill as a result of a week or two's very heavy spirit-drinking. Four showed clinical signs of congestive heart failure with audible arterial bruits and a diastolic pressure down nearly to zero; but unfortunately it was not possible to obtain either radiograms or electrocardiograms. (It would be of great interest to ascertain the length of the P–R intervals in this type of case.) Three were men under 35 years of age and in these, with appropriate treatment, recovery was comparatively rapid, and both systolic and diastolic levels soon reached the normal. The fourth, an older man, developed pneumonia, and had a stormy passage but recovered eventually. In none of these was an aortic regurgitant murmur heard. These are in addition to the cases of congestive heart failure found in the chronic alcoholic, some of whom resembled Dr. Price's case very closely. In the periodic drinker it is doubtful whether two weeks' lack of vitamin B_1 would be sufficient to cause the condition, and even in Dr. Price's case the patient had for the last fortnight "subsisted on little else but alcohol." I believe therefore that alcoholic poisoning may have been at any rate partly responsible for the ensuing heart failure.

However, as your reviewer has hinted and as will be evident from Dr. C. C. Ungley's Goulstonian lecture (April 16th, p. 879) an accurate test is now available for the quantitative estimation of vitamin B_1 in the blood, and of vitamin C, which also seems concerned in heart failure, as Dr. W. Evans has shown (Feb. 5th, p. 308).

It would have been of interest to have known the patient's blood-sugar level prior to treatment, for it is probable that hypoglycæmia was also present in spite of his exclusive carbohydrate diet. Again, how was the patient treated as regards his alcohol? Was it stopped suddenly, and, if so, were there any deprivation symptoms?

I am, Sir, yours faithfully,

Clifton, Bristol, April 27th. KENNETH SOLTAU.

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GUY'S HOSPITAL

To the Editor of THE LANCET

SIR,—May we be permitted, through the hospitality of your columns, to renew our appeal on behalf of the extension fund of Guy's Hospital. Through the generosity of the public some £200,000 of the £500,000 originally appealed for has been received or promised conditionally since July, 1936, —coming from people in every walk of life in a warm-hearted response to the hospital's call for help, and enabling us to complete the arrangements for the following:—

	£
Reconstruction of the dispensary	12,500
Erection of a children's ward	20,000
Considerable reduction of our debt by the sum of	82,262
Enlargement to the nurses' home in the event of the amount appealed for being raised ..	80,000

Every effort has been made to keep down expenses, and we are pleased to state that the inclusive cost of the appeal to date is only 5·8 per cent.

We are sincerely grateful for the generous response with which our appeal has met, and which has encouraged us to renew our efforts to raise the remaining £316,000 necessary for the essential rebuilding and completion of the following:—

	£
Additional accommodation for wardmaids ..	18,260
Rebuilding of the surgical block	214,540
Completion of reduction of debt	83,238

It is a natural sequence of events that an increased demand on the services of the hospital necessitates a larger nursing staff and, in consequence, an increased domestic staff. The extension of the wardmaids' hostel will not only ensure the necessary additional accommodation but will enable the centralisation of this service within the hospital's precincts.

The surgical block is the original hospital built by Thomas Guy in 1725. In the interests of economy its rebuilding has been delayed again and again, and the whole question deferred until urgency demands action. The hospital architect, moreover, reports that the outer walls are beginning to sink. This calls for immediate measures if the whole of the surgical work is not to be seriously curtailed or even stopped.

Our present maintenance cost is approximately £221,000, which is the lowest possible figure at which we can economically maintain our huge organisation, the size of which has been determined by the demands made upon our services. Our assured income amounts to £69,000, leaving us with a deficit of £152,000 per annum to be obtained from voluntary sources. In recent years this sum has not been obtained, and in consequence an annual deficit has accumulated to a debt of serious proportions.

The time has now come when it is essential, if we are to maintain the high standard of our services, to enlarge and rebuild our present departments. So many appeal to us for help—and for the sake of humanity and future generations it is imperative that the service we give must be in accordance with the highest traditions of modern medicine and surgery. If the money for this appeal is forthcoming then the services of Guy's will continue; but if we fail in our efforts it is more than probable that it will be necessary to curtail those services which we are so happy to give, and for which there is an ever-increasing demand. Although we are a London hospital, our work is not confined to the metropolis —42·18 per cent. of our patients come from the rest of the British Isles, and our doctors, dentists, and nurses are serving in every part of the Empire.

Experience makes us appreciative of the insistent demands made upon the pockets of so many at the present time; but we would give every assurance that any response, however small in measure, will be most gratefully received, and will convince us that the splendid work of Guy's is not without recognition from the British public.

We are, Sir, yours faithfully,

GOSCHEN,
President of Guy's Hospital;
NUFFIELD,
Treasurer of Guy's Hospital;
ALFRED BEIT,
Chairman, Extension Fund Appeal Committee;
EBBISHAM,
Vice-Chairman, Extension Fund Appeal Committee;
ERIC G. WALEY,
Chairman, Standing Appeal Committee.

May 5th.

SULPHANILAMIDE AND PENTOTHAL

To the Editor of THE LANCET

SIR,—Since the recent increase in the use of sulphonamide preparations, an anæsthetic risk has arisen which I have not yet seen mentioned in the medical press. It is recognised that in certain individuals the simultaneous exhibition of sulphanilamide and drugs containing sulphur may cause sulphæmoglobinæmia. As the molecule of Pentothal sodium contains a sulphur atom and the drug is given intravenously, it seems probable that trouble may arise if it is given to a patient who is receiving sulphanilamide.

I am, Sir, yours faithfully,

C. LANGTON HEWER.

Queen's-road, N.W., May 3rd.

A STANDARD FOR PREMATURITY

IN the course of a periodical revision of the well-known clinical report of Queen Charlotte's Maternity Hospital, the definition of prematurity came up for discussion. It was decided to refer this matter to the British Pædiatric Association and to the section of the study of disease in childhood of the Royal Society of Medicine. These two bodies nominated a joint committee consisting of Dr. Norman Capon, Dr. Helen Mackay, Dr. Kenneth Tallerman, and Dr. Alan Moncrieff. After due consideration this committee suggested a definition based upon a standard of 5½ lb. or under, and the result of their deliberations was circulated to various interested bodies, including the Royal College of Physicians of London and the British College of Obstetricians and Gynæcologists. Neither of these two organisations was fully satisfied with the wording of the definition and a joint committee was set up consisting of Sir Ewen Maclean (B.C.O.G.), Sir Arthur MacNalty (R.C.P. and Ministry of Health), Prof. W. W. Jameson (R.C.P.), Prof. Fletcher Shaw (B.C.O.G.), Dr. Hector Cameron (R.C.P.), Dr. Percy Stocks (R.C.P. and General Register Office, Somerset House), and Dr. Moncrieff (R.C.P.). This committee came to the conclusion that it was impossible to define prematurity satisfactorily, but with regard to the purposes for which the proposed definition would be used they agreed that some standard was desirable. They therefore put forward a recommendation which was afterwards

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somewhat modified, and the final proposal reads as follows :—

"That in conformity with the standard in international use an infant whose birth-weight is 5½ lb. (approximately 2500 grammes) or less, shall be considered, for the purpose of comparison of records, as either immature or prematurely born, according as the estimated period of gestation is full time or less."

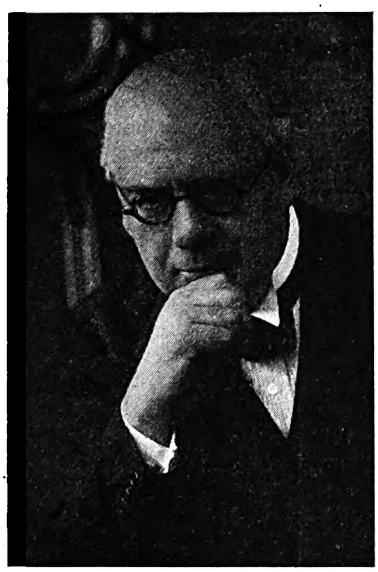
It is hoped that this standard will now be utilised by all maternity institutions, public health authorities, and others concerned with the new-born baby, so that comparison of results will be possible.

OBITUARY

W. H. MAXWELL TELLING, M.D., F.R.C.P. Lond.

Dr. Maxwell Telling died of cerebral hæmorrhage at his home in Leeds on April 28th at the age of 63. For several years his health had given cause for anxiety, but he refused to regard himself as a sick man, and continued to carry on his activities—medical, social, scientific, and educational—until three days before his death.

Walter Henry Maxwell Telling was born in Surrey, educated at Camberwell Grammar School, and entered Guy's Hospital where he had a brilliant career. He graduated in 1898 and took the gold medal at the M.D. Lond. in 1901. After holding at Guy's a resident obstetric and other appointments Telling went to Leeds (at the age of 25) as resident medical officer at the General Infirmary, to which he remained attached all his life. He became assistant physician in 1903, physician in 1912, and consulting physician in 1933. He was also physician to several of the smaller hospitals in the surrounding area. He was elected F.R.C.P. in 1913 but took no active share in the affairs of the College, preferring to devote his interests to the medical life of his adopted town. During the late war he acted as divisional medical officer at the 2nd Northern General Hospital with the rank of lieut.-colonel.



[Photograph by Bacon

At the General Infirmary Telling established a reputation as a sound and inspiring clinical teacher. From the start his energies were directed to the improvement of clinical teaching, and the high standard of medical education in the Leeds school of medicine to-day owes much to his work and his example. He was a wise, careful, and conscientious physician, full of common sense and understanding, and had the ability to create, to foster, and to encourage these qualities in students. As a teacher he was insistent on careful and systematic observation and on a clear setting out of results obtained. On the facts thus well marshalled and recorded he would bring to bear a mind logical and reasonable, and a diagnosis would appear simply, naturally, and (as it seemed) inevitably. At the bedside he had little use for text-book medicine.

Telling was not content, however, just to improve existing methods; he was a reformer with a progressive outlook, and he originated changes which have proved beneficial both to the hospital and to the school. Early in his career, with the help of the late J. F. Dobson, he set up at what was then the Women and Children's Hospital a separate children's clinic, to be transferred later to the General Infirmary where it became a department with a specialist physician. He also had a share in the formation of a dermatological department which now has two physicians attached. His work in improving the nurses' curriculum of instruction, in forming the nurses' training school, and in getting the University to grant a diploma in nursing, will always be remembered. In the University he held in succession three chairs: in 1923 he was appointed professor of therapeutics, in 1925 he succeeded to the chair of medicine, and on his retirement from the latter he accepted the chair of forensic medicine. He was peculiarly fitted for the forensic chair; he enjoyed medico-legal work, and was highly esteemed as an expert witness. In his practice he was keen on psychological medicine and was recognised as an authority. He did not contribute much to medical literature, but what he wrote was important; his paper on diverticulitis remains a classic.

Maxwell Telling was a strong personality, of tenacious opinion, persuasive in argument, relentless and sometimes possibly unreasonable in opposition. But he was a genial and generous friend, witty and entertaining in company, a delightful after-dinner speaker, and one who enjoyed the good things of life when he could share them with others. In his home he had many interests. He was a great lover of his garden, which he made into a thing of beauty and charm, and here he spent most of his leisure time. He was also a knowledgeable collector of china, of which he possessed many valuable specimens. He took a great joy in entertaining his friends, amongst whom were many well-known members of musical and artistic circles, and as a host his genial personality was seen at its best. His worth to the community was recognised a few months ago when he was made a justice of the peace for the city of Leeds.

Two of Maxwell Telling's friends write of the impression he made upon his contemporaries. One says: "His early death deprives Leeds of a formidable and impressive public figure, a rare combination of zeal and diligence with a gracious, kindly, and urbane nature. If the latter aspect of his character was not immediately evident it was hidden only by the fervour with which he threw himself into the work at hand. For many years he devoted himself with intense industry to the advancement of medicine in the West Riding; he was a bold and self-confident pioneer, advocating reforms which are now so much incorporated in the Leeds medical tradition that it seems incredible they could ever be the subject of controversy. First and foremost he was an alert and learned physician, but his energies overflowed freely into all kinds of activities in philosophy, law,

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art, music, sociology, and mysticism. He knew the whole range of human emotions and he had many triumphs and many disappointments; but in joy or sorrow he walked erect and imperturbable." The other says: "Dr. Maxwell Telling was one of those men whom our profession can ill spare. While many of our leading men were declaring that no real advance was taking place in medicine because of the lack of 'an indefinable something,' Telling came boldly forward and declared that we were being held up because we had left God out of our lives. I first met Dr. Telling at a house party of the Oxford Group with which he became associated in the latter years of his life. He fearlessly adopted the standards of Jesus Christ, and whole-heartedly identified himself with what as a psychologist he described as 'an ever-increasing body of skilled and devoted workers who accomplish the healing of psychologically tangled lives in a way which comes near to the miraculous.' He lost no opportunity of stressing his conviction that the true basis of health was spiritual."

Dr. Telling married Ingeborg, daughter of Julius Aagard, and leaves a widow, two daughters, and a son.

SIR MAURICE ABBOT-ANDERSON, C.V.O., M.B. Durh.

Sir Maurice Abbot-Anderson, who died at Bath on May 3rd at the age of 77, was until his retirement a distinguished figure among London general practitioners. He had for many years combined a big City practice with a West-end one, meeting the convenience of his many patients among business men by keeping a consulting-room in Birchin-lane, but towards the end of his career he worked only in the West End. He had the advantage of good looks as well as personal charm. His appearance, manner, and approach have been described as those of the ideal practitioner and since he combined these external qualities with a deep concern for his patients, and untiring efforts to make them better if not well, his success was assured. Sir Maurice was the son of Major-General Edward Abbot-Anderson, whose other two sons are well known on the stage as Mr. Allan Aynesworth and Mr. Louis Goodrich. He studied medicine at University College, London, and was house physician at University College Hospital before settling in general practice. He found time to contribute to medical journals and to write also on a subject that interested him profoundly—the protection of wild flowers, ferns, and trees. To promote this end he founded Flora's League, and became a member of the executive committee of the Council for the Preservation of Rural England. He was also a member of the National Trust.

Sir Maurice was physician, and later honorary physician, to the late Princess Royal (Duchess of Fife). He was created M.V.O. in 1906, a knight bachelor in 1912, a knight of grace of the Order of St. John of Jerusalem in 1922, and C.V.O. in 1925.

FRANCIS LIONEL PROVIS, M.R.C.P., F.R.C.S. Edin.

Dr. Provis, who died on Monday last at the age of 65, was younger son of Wilton Provis of Mere, Wilts, and was educated at Bromsgrove School. After qualifying from St. Bartholomew's Hospital in 1898 he held resident appointments at Tottenham Hospital and became medical registrar at the Chelsea Hospital for Women before joining Lady Curzon's hospital unit in South Africa, where he was attached to the I.Y. Hospital at Pretoria. After returning home he took higher diplomas at Edinburgh and then settled in London to become surgeon to the Chelsea Hospital, holding a number of other appointments at the Italian Hospital, St. Pancras Dispensary, and Prince of Wales General Hospital. His interest was divided between radiology and gynæcology; he was specially interested in the relief of pain and published in our columns a large series of cases in which he had combined stovaine with twilight sleep in gynæcology. After retiring from private practice he continued his work at the St. Pancras clinic until his final illness. He married in 1913 Miss Gladys Barrett; there were no children of the marriage.

Mr. Victor Bonney writes: "All those who are connected with Chelsea Hospital for Women will mourn the passing of Lionel Provis. He joined the hospital as registrar in 1902, became a member of the honorary staff in 1903, and for twenty-seven years did his utmost for it. He was early interested in the application of radiology to gynæcology and is justly to be considered as one of the pioneers in that subject. He was a careful and conscientious surgeon, and a gentle and humane man with a high sense of the responsibility he owed to his patients. His health broke down and compelled him to resign from the staff in 1931, but he did not entirely dissever himself from his work and indeed continued it so far as he was able almost to the time of his death. He will be best remembered by those who had the privilege of working with him for his kindness of heart, his honesty, his contempt of everything savouring of jealousy or meanness, and most of all for the uncomplaining courage with which he bore his misfortunes."

PARLIAMENTARY INTELLIGENCE

QUESTION TIME

WEDNESDAY, APRIL 27TH

English-speaking Medical Unit in China

Mr. MATHERS asked the Prime Minister whether he had received a report upon the work of the English-speaking medical unit in China; and whether he had any statement to make.—Mr. BUTLER, Under-Secretary for Foreign Affairs, replied: The position remains as stated in my reply of April 6th. I learn from private sources that the English-speaking unit has set up its headquarters at Changsha and is working in close contact with the Chinese Government health administration.

London Hospitals and Air-raid Precautions

Colonel NATHAN asked the Home Secretary what was the division of responsibility for air-raid precautions in regard to the main and special hospitals of London between his department and the Ministry of Health.—Mr. G. LLOYD, Under-Secretary, Home Office, replied: The general responsibility for air-raid precautions rests on my right hon. friend the Secretary of State, but in the matter of hospitals there is and will be consultations with my right hon. friend the Minister of Health.—Mr. R. C. MORRISON: Will the hon. gentleman do what he can to facilitate some decision either by his Department or by the Ministry of Health in view of the fact that local authorities in many cases are unable to proceed with the best part of their schemes until they know the position in regard to the base hospitals?—Mr. LLOYD: I appreciate the point, and my right hon. friend is in active consultation with the Minister of Health.—Mr. THORNE: Is it the real intention of the Government to make any grant to the hospitals in cases of casualties from air raids?—Mr.

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LLOYD: In the case of hospitals designated as casualty clearing hospitals the local authorities would be able to make a grant under the Act.

THURSDAY, APRIL 28TH

Rearmament and Strain on Factory Workers

Mr. DAVID ADAMS asked the Minister of Labour whether he was aware that the cost of rearmament might be materially increased through friction arising from the strain and fatigue of increased speed in factories; and whether, with a view to diminishing this, special measures of coöperation between works management and employees would be considered.—Mr. E. BROWN replied: I am not aware that there is at present any lack of coöperation between works managements and workpeople in this connexion. If the hon. Member will let me have any information which he has I shall be most interested to look into it, because this is a very important subject.

Nursing Services Committee

Sir ARNOLD WILSON asked the Minister of Health whether the interdepartmental committee on nursing services would issue an interim report.—Sir KINGSLEY WOOD replied: I understand that the committee have in mind that it may be desirable to issue an interim report.

Radium and Cancer

Mr. LIDDALL asked the Minister of Health if he was aware that deaths from cancer in the city and county borough of Lincoln had risen from 96 in the year 1927 to 126 in the year 1936, and that cancer had now moved up to second place in the list of fatal diseases throughout the country; and as, quite apart from occupational malignant disease, this increase was due to the Minister's failure to recognise the urgent need for full provision for the adequate treatment of the many precancerous general medical and surgical conditions, what steps he proposed to take to remedy this state of affairs.—Sir KINGSLEY WOOD replied: The answer to the first two parts of the question is in the affirmative. In any comparison of the numbers of deaths due weight must be given to two important factors—namely, the greater ages to which people now live and the improved methods of diagnosis. As my hon. friend will be aware, the work of the Radium Commission in recent years has resulted in the formation of a number of centres for the treatment of cancer, one of which is situated in Lincoln.

MONDAY, MAY 2ND

Malaria and Quinine

Mr. DAVID ADAMS asked the Under-Secretary of State for India whether he was aware that it was officially estimated that the financial loss suffered through malaria in India alone was between £23,000,000 and £50,000,000 per annum; and what steps were proposed to check this loss, which was closely connected with inadequate access to chemical compounds or with unduly high prices due to inadequate supplies.—Lord STANLEY replied: I would remind the hon. Member that the control of the production, distribution, and sale of quinine and allied alkaloids is now a matter for the Provincial Governments. The Central Advisory Board of Health have had the whole matter under consideration and passed a number of resolutions on the subject last June.

Air-raid Instruction

Mr. ROBERT MORRISON asked the Home Secretary whether he would make arrangements with the St. John Ambulance Association to enable air-raid volunteers taking a first-aid course to do so without charge.—Mr. GEOFFREY LLOYD, Under-Secretary, Home Office, replied: The principle has been laid down that no charges should be made to any person for training for any of the local authority services for which they have volunteered, and if in any case the St. John Ambulance Association are making a charge it must be due to a misunderstanding. My right hon. friend will take steps to have the general position clearly understood.

Overcrowding

Mr. TEMPLE MORRIS asked the Minister of Health the names of those districts for which, owing to special reasons, no appointed day had yet been fixed with regard to the reduction of overcrowding.—Sir KINGSLEY WOOD replied: Appointed days have now been fixed in all cases.

TUESDAY, MAY 3RD

Emergency Food-supplies in London

Mr. DAY asked the President of the Board of Trade whether he had now completed his arrangements for the appointment of divisional food officers who would be responsible for safeguarding food-supplies during an emergency in London and the Home Counties; and would he give the names of the officers so appointed.—Captain WALLACE replied: The work which, in other parts of Great Britain, is being undertaken by the divisional food officers is at present being carried out in London and the Home Counties by officers at the headquarters of the Food (Defence Plans) Department. It is not proposed to appoint divisional officers in London and the Home Counties until the plans in preparation in the department are further advanced, but arrangements have been made to secure the nomination of persons to act as food executive officers for all local authority areas in the Metropolitan police district, and approaches are now being made to other local authorities in the Home Counties.

New Medical Standards for Recruits

Sir ALFRED KNOX asked the Secretary of State for War what number of men were approved as recruits in the first quarter of the present year who would not have been accepted under the standards, medical and otherwise, in force previous to last autumn.—Mr. HORE-BELISHA replied: The common-sense changes which have been made in the medical and other standards for recruits secured for the Army during the first quarter of this year an extra 1733 men, out of a total of 10,504, accepted.

Medical Benefits: Specialist and Pathological Services

Mr. DAVID ADAMS asked the Minister of Health whether he was aware of opinions widely held by certain experts that the nation was not obtaining a proper return for the money now expended upon public health; and whether the Government were considering measures, financial or administrative, to extend the scope of medical benefits so as to include consultant, specialist, and pathological services so that a more fundamental attack upon health problems might be made.—Mr. BERNAYS replied: As regards the first part of the question varying opinions have been expressed on this subject. As regards the second part of the question important matters of finance and administration are involved and my right hon. friend could not undertake to make any pronouncement on the subject, which would have to be considered at the proper time in relation to the general financial resources of the country.—Mr. ADAMS asked whether, in view of the admitted widespread necessity for further action on the lines of the question, the Parliamentary Secretary intended to give it further consideration.—Mr. BERNAYS said that the question was largely concerned with insured persons and it was very largely a matter of accommodation in hospitals set up for special diagnosis and treatment of disease under the Local Government Act, 1929. The number of those hospitals was steadily increasing.

MEDICAL RESEARCH IN MOSCOW.—Work is proceeding on some of the buildings of the All-Union Institute of Experimental Medicine at Serebryanny Bor, on the outskirts of Moscow. The institute will occupy a site of 150 acres and on completion (it is hoped in 1940), will be one of the world's largest centres of medical research. The buildings of the chemical section and of the department of general physiology and metabolism are to be opened this year. An experimental shop for the manufacture of instruments, and quarantine quarters for animals are nearing completion. Work will soon be begun on the 12-storey building of the main clinic. The library is to accommodate 300,000 volumes.

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MEDICAL NEWS

University of Oxford

On April 28th the degree of B.M. was conferred on R. Roaf, in absentia.

University of Cambridge

On April 30th the following degrees were conferred :—

M.Chir.—D. N. Matthews.
M.B., B.Chir.—S. T. Anning (by proxy), A. W. Box, E. W. Dorrell, F. E. S. Hatfield, and L. A. C. Wood.
M.B.—J. W. Parks and J. G. Chappel.

At a congregation of the senate on the same day it was decided to confer on June 9th the honorary degree of Sc.D. on Dr. F. Peyton Rous of the Rockefeller Institute for Medical Research, New York.

Dr. G. D. Channell and Dr. F. Wemyss Smith have been appointed demonstrators in anatomy for three years.

Royal College of Physicians of London

At a meeting of the college on April 28th, with Dr. Robert Hutchison, the president, in the chair, Dr. H. L. Tidy was elected registrar of the college.

The following members were elected fellows :—

Arthur Wellesley Falconer, M.D. Aberd. (Cape Town); John Forbes Ward, M.D. Manch. (Manchester); Stanley Graham Ross, M.D. McGill (Montreal); John Vernon Cannadine Braithwaite, M.D. Lond. (Leicester); John Edwin Mackonochie Wigley, M.B. Melb. (London); Robert Coope, M.D. Liverp., (Liverpool); Frances Braid, M.D. St. And. (Birmingham); Cyril William Curtis Bain, M.D. Oxon. (Harrogate); Henry Henderson Moll, M.D. Rome (Leeds); Richard Sydney Allison, M.D. Belf. (Belfast); William Alexander Lister, M.D. Camb. (Plymouth); Cyril Lloyd Elgood, M.D. Oxon. (London); Henry Brian Frost Dixon, M.D. Dubl., Lieut.-Colonel, R.A.M.C. (Gibraltar); Julia Bell, M.A. Dubl. (London); James Gordon Danson, M.D. Aberd., Surgeon Captain, R.N. (Gosport); Robert James Pulvertaft, M.D. Camb. (London); Peter Henry Martin, M.B. Oxon. (London); Douglas Hamilton Macleod, M.B. Lond. (London); Sydney Watson Smith, M.D. Edin. (Bournemouth); Aubrey Julian Lewis, M.D. Adelaide (London); Denis Hubert Brinton, M.B. Oxon. (London); Hugh Alexander Dunlop, M.D. Lond. (London); Hugh Leslie Marriott, M.D. Lond. (London); George White Pickering, M.B. Camb. (London); Horace Evans, M.D. Lond. (London); Harold Percival Himsworth, M.D. Lond. (London); William George Barnard (London); John Clifford Hoyle, M.D. Lond. (London); Archibald Gilpin, M.D. Lond. (London); Ernest Thomas Conybeare, M.D. Lond. (London); Soliman Azmi Pasha, M.D. Cairo (Egypt); John Fleming Brock, M.D. Oxon. (Cape Town); William Drew Nicol, M.B. Lond. (Epsom); Russell John Reynolds, M.B. Lond. (London); and Ram Nath Chopra, M.D. Camb., Brevet-Colonel, I.M.S. (Calcutta); and under By-law XXXVIII (b): Sir Almroth Wright, F.R.S. (London); Herbert Stanley Raper, F.R.S. (Manchester); James Bertram Collip, F.R.S. (Montreal): and George Richards Minot, M.D. (Cambridge, Mass.).

The following were admitted members of the college :—

Simon Almond, M.B. Manch., Reginald Nevill Cudmore Bickford, M.B. Adelaide, Ronald Victor Christie, M.D. Edin., Richard Frederick Clarke, M.B. Lond., Edward George Huxley Cowen, M.D. Lond., Christopher Sydney Darke, M.B. Lond., David Howard Davies, M.B. Camb., Antony Clifford Dornhorst, M.B. Lond., Bernard Freedman, L.R.C.P. Lond., William Goldie, M.B. Aberd., Frederick William Gordon, M.D. Aberd., Ronald Douglas Green, M.D. Lond., John Charles Harland, M.B. Lond., Mohammed Radwan Kenawy, M.D. Cairo, David Kendall, M.B. Oxon., Edwin Howard Kitching, M.D. Leeds, Kenneth Arthur Latter, M.B. Lond., Richard Edward Kenny Levick, M.B. Camb., Valentine Darte Logue, L.R.C.P. Lond., Frank Rees Magarey, M.B. Adelaide, Frederick John William Miller, M.B. Durh., Mangalore Narasimha Pai, M.B. Madras, Seymour Cochrane Shanks, M.D. Glasg., André Nasri Tagher, M.B. Cairo, Edward Wing Twining, L.R.C.P. Lond., Dorothy Caroline Ranita Vethavanam, M.B. Madras, Henry John Wade, M.D. Manch., and Solomon Simon Yudkin, M.B. Lond.

Licences to practise were conferred upon 194 candidates (178 men and 16 women) who have passed the final examination of the Conjoint Board and complied with the by-laws of the college. The following are the names and schools of the successful candidates :—

J. C. G. Abraham, Oxon. and Middlesex; H. W. Adeney and R. S. Alexander, Camb. and Lond.; H. G. A. Almond and H. Alstead, Liverp.; J. Arnott, Camb. and St. Thos.; C. S. Ashwell, Birm.; P. A. G. M. Assmann, Middlesex; A. H. Bacon, St. Bart.'s; K. P. Ball, Middlesex; J. E. Barker, St. Bart.'s; A. H. Baynes, Camb. and King's Coll.; J. P. Bentley, Charing Cross; A. E. Benyon, King's Coll.; R. D. Blachford, Guy's; Janet E. Bottomley, Roy. Free; H. W. Bradford, Middlesex; J. T. Brooks, Roy. Halifax Infirmary; R. W. W. Brown, Camb. and Univ. Coll.; W. G. Brown, Manch.; C. N. Burnham-Slipper, St. Bart.'s; F. J. Cahill, Melb.; K. Chartikavanij, Guy's; A. A. G. Clarke, St. Geo.; P. Cohen, St. Mary's; R. P. Coldrey, Univ. Coll.; G. B. Collyer, Guy's; R. Cox, Westminster; E. Cronin, Camb. and King's Coll.; A. G. Cunningham, St. Bart.'s; A. H. Cutting, King's Coll.; J. R. G. Damrel, St. Geo.; H. W. D'Arcy, Middlesex and Westminster; T. T. Davies, Guy's; C. H. C. Dent, Camb. and St. Mary's; L. J. D'Souza, Manch.; A. P. Dick, Camb. and Lond.; Nancy K. Dick, Roy. Free; A. E. Dreosti, Cape Town; W. J. Drummond, Guy's; D. M. Dunn, St. Bart.'s; D. F. Eastcott, Univ. Coll.; J. E. B. Elliott, Birm.; E. L. Ellis, St. Thos.; G. H. Ellis, St. Bart.'s; Winifred M. Emmet, Roy. Free; R. L. Evans, Guy's; C. G. Fagg, St. Bart.'s; F. E. Falconer, Guy's; D. B. Feather, Leeds; D. W. Fell, St. Mary's; B. S. Fishman, Middlesex; D. Foskett, Camb. and St. Thos.; G. P. Fox, Camb. and Lond.; A. L. Frazer, St. Bart.'s; M. J. G. Furnell, Lond.; D. Garces, Camb. and St. Thos.; T. C. N. Gibbens, St. Thos.; G. N. L. Godber, Guy's; W. Goulstone, Camb. and St. Thos.; A. C. Greene and W. S. Hacon, Guy's; R. B. Halford, St. Bart.'s; A. S. Hall, Alberta and St. Geo.; I. M. Hall and W. G. L. Hall, Univ. Coll.; R. G. Harcourt, St. Thos.; J. B. Hargreaves, Liverp.; S. W. G. Hargrove, Camb. and St. Thos.; M. H. Harmer, Camb. and St. Bart.'s; J. Harris, Cardiff; Violet E. N. Harris, Roy. Free; L. T. Harrison, St. Geo.; N. W. A. Harvey, St. Thos.; J. L. Henderson, St. Bart.'s; Rosa Hertz, Roy. Free; C. J. C. G. Hodson, St. Mary's; S. J. Hopkins, Guy's; Mary C. Hopper, Roy. Free; E. P. Houghton, Liverp.; G. N. Hunt, Camb. and St. Mary's; Myrtle M. Hutchins, Brist.; C. W. Iliffe, Westminster; M. A. Imray, Guy's; H. H. W. Jackson, Lond.; K. V. Jackson, St. Bart.'s; H. N. James, Camb. and Middlesex; Ursula James, Roy. Free; J. G. Jamieson, St. Bart.'s; T. H. Jenkins, Univ. Coll.; R. C. Jenkinson, Westminster; P. H. Jobson, King's Coll.; B. M. Joffe, W'rand and St. Geo.; G. B. Jones, Univ. Coll.; G. M. Jones, St. Mary's; H. M. R. Knight, Guy's; H. Knowles, St. Bart.'s; Henny E. Kornerup, West Lond.; C. C. Lack, Camb. and Lond.; J. Laughlin, Camb. and Middlesex; S. C. Lavine, Middlesex; H. W. D. Lawton, Manch.; G. B. Leyton, Camb. and Westminster; M. A. Linell, Westminster; G. M. Little, Camb. and Univ. Coll.; B. G. B. Lucas, Middlesex; R. L. McKernan, St. Thos.; R. J. H. McMahon, St. Bart.'s; B. Maddison, Guy's; D. W. Mahon, Lond.; R. H. C. Manifold, St. Thos.; C. W. S. Marris, Birm.; A. G. Marshall, Camb. and St. Bart.'s; R. A. Mathews, W'rand and Brist.; C. M. Miller, Leeds; W. G. Mills, Birm.; Agnes M. D. Milne, Roy. Free; L. E. Milton, Guy's; G. W. Miskin, St. Thos.; P. L. Mollison, Camb. and St. Thos.; H. E. Moody, Guy's; J. Moroney, Liverp.; D. Morris, Middlesex; D. S. Morris, St. Bart.'s; D. D. Muir, Middlesex; G. M. Muller, Ceylon; M. Murray, Middlesex; J. L. Newton, Westminster; R. T. Norman, St. Thos.; J. P. J. O'Keefe, Guy's; Eileen B. Palmer, Roy. Free; G. F. Panton, Camb. and St. Thos.; R. L. Parkinson, Manch.; S. M. Paw, Rangoon; J. G. Peacock, St. Thos.; H. G. Percy, Camb. and St. Mary's; R. Piper, Middlesex; S. S. F. Pooley, St. Thos.; A. S. Porter, St. Bart.'s; K. R. D. Porter, Guy's; Dorothy M. Pritchard, Roy. Free; R. H. Roberts, Liverp.; Hilda M. Robertshaw, Roy. Free; L. F. W. Salmon, Guy's; C. R. Savage, St. Thos.; I. R. Seal, St. Geo.; J. D. Sellars, Manch.; J. N. SenGupta, Dublin and West Lond.; W. M. H. Shaw, Leeds; M. Shepherd, Lond.; J. E. Simpson, St. Geo.; M. A. Slee, St. Thos.; J. H. Smart, Guy's; D. J. N. Smith, Charing Cross; J. W. Smith, St. Thos.; P. M. Smythe, Camb. and Lond.; S. G. Solomon, Middlesex; M. S. C. Stephens, St. Mary's; C. J. Stewart, Guy's; F. E. Stock, King's Coll.; S. D. Stone, St. Bart.'s; W. P. B. Stonehouse, Camb. and Guy's; B. D. Stutter, Middlesex; J. E. Symondson, Charing Cross; J. M. Teasdale, Leeds; A. M. Thomas, Camb. and Middlesex; D. C. Tomlins, Middlesex; P. Tomlinson, St. Thos.; R. A. R. Topping, Guy's; Vasant H. Trivedi, Bombay; P. E. R. B. Unwin, St. Thos.; J. R. M. Vance and F. H. Vieyra, Univ. Coll.; O. M. Vyas, West Lond.; A. P. B. Waind, Leeds; A. C. R. Wakeman and A. J. Walker, Guy's; Betty Walker, Roy. Free; J. O. Walters, Cardiff; A. J. Walton, Camb. and Lond.; J. W. Warrick, King's Coll.; J. S. F. Watson, Camb. and Guy's; B. G. Wells, St. Mary's; R. J. Whiting, Univ. Coll.; E. G. Wilbraham, King's Coll.; D. R. P. Wilkie, Lond.; T. G. Williams, Middlesex; D. S. Wilson, Guy's; G. A. Wilson, Camb. and St. Thos.; M. M. Wilson, Camb. and Lond.; J. W. Wood, Camb. and Middlesex; Ursula W. Wood, Brist.; P. J. Wormald, Camb. and Middlesex; and C. F. Wright, Guy's.

Diplomas in tropical medicine and hygiene were conferred (jointly with the Royal College of Surgeons) upon the following :—

W. J. Alkan, L. G. Backhurst, N. D. Bakhash, E. A. Beet, J. Bennett, R. S. Bunny, M. S. David, P. L. Deshmukh, E. P. N. M. Early, R. N. Fowler, V. A. Gupte, W. E. Hadden, R. F. Hand, I. M. Hill, F. A. U. K. Kandalla, E. N. C. McAmmond, I. W. MacKichan, J. G. Mar, J. S. Minett, S. K. Mukherjee, V. R. Naidu, Sharda S. Naidu, L. Nandkeolyar, A. R. Pons, S. Ram, V. D. Seevaretnam, D. K. Shah, H. B. Shookhoff, and W. M. Toon.

The following were appointed representatives of the college: Lord Dawson of Penn on the governing body of the British Postgraduate Medical School; Lord Horder at the Cremation Conference to be held at Oxford in July; Sir Reginald Bond on the Professional Classes Aid Council; Dr. Dawtrey Drewitt on the committee of management of the Chelsea Physic Garden; Dr. William Brown at the tenth International Medical Congress for Psychotherapy to be held at Oxford in July; Dr. Eric Pritchard at the National Conference on Maternity and Child Welfare at Bristol in July; and Dr. R. R. Trail at the annual con-

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ference of the National Association for the Prevention of Tuberculosis in London at the end of June. The Croonian lectures will be delivered by Prof. F. R. Fraser at the college on May 24th, 26th, and 31st, at 5 P.M. He will speak on the clinical aspects of the transmission of the effects of nervous impulses by acetylcholine.

University of Aberdeen

The senate will award A. W. Garden fellowships in June.

The fellowships are tenable from three to five years and are of an annual value of not less than £200. Graduates of medicine of any British university are eligible, but preference will be given to graduates of the University of Aberdeen. Applications should be sent to the secretary of the university, Marischal College, Aberdeen, before May 31st.

Royal Free Hospital

The following post-graduate scholarships are open to former students of the hospital:—

A. M. Bird scholarship.—£200 for one year to enable a medical graduate to obtain general experience in pathology.

Mabel Webb and A. M. Bird research scholarship.—£200 a year for assistance in carrying on research.

Applications must be sent before May 22nd to the warden of the medical school, Hunter-street, London, W.C.1.

Naval Medical Compassionate Fund

At the quarterly meeting of the directors of this fund, held on April 22nd, with Surgeon Rear-Admiral S. F. Dudley in the chair, the sum of £214 was distributed among the applicants.

Change of Name

The Hospital for Epilepsy and Paralysis and Other Diseases of the Nervous System has changed its name to the Maida Vale Hospital for Nervous Diseases.

London Hospital Medical College

Dr. Robert Hutchison, the president of the Royal College of Physicians of London, will present the prizes to the students of the London Hospital on Thursday, June 30th.

Lebanon Hospital for Mental Diseases

Sir Wyndham Deedes will preside at the 39th annual meeting of this hospital, to be held at the Cora Hotel, Upper Woburn-place, London, W.C., at 4.45 on Tuesday, May 17th (tea 4.30). The medical speakers will be Dr. Percy Smith (president of the hospital), Sir Hubert Bond, and Dr. Serin of Paris. The London office is at Drayton House, Gordon-street, W.C.1.

Travelling Fellowships in Medicine

The Medical Research Council invite applications for six Rockefeller medical fellowships for the academic year 1938–39, which will be provided from a fund with which the council have been entrusted by the Rockefeller Foundation of New York. They are intended for British graduates who have had some training in research work in clinical medicine or surgery, or in some other branch of medical science, and who are likely to profit by a period of work at a centre in the United States or elsewhere abroad, before taking up positions for higher teaching or research in the United Kingdom. The stipend will ordinarily be at the rate of £360 per annum for a single fellow, and of £480 per annum for a married fellow. Travelling expenses and some other allowances will be paid in addition.

The council also invite applications for four Dorothy Temple Cross research fellowships in tuberculosis, which are awarded from a special endowment of which the council are the trustees. The object of these fellowships is to give opportunities for study or research to qualified British men or women "intending to devote themselves to the advancement by teaching or research of curative or preventive treatment of tuberculosis in all or any of its forms." The stipend will ordinarily be at the rate of £360 per annum for a single fellow, and of £480 per annum for a married fellow, with an allowance for travelling and incidental expenses.

Applications for any of these fellowships must be lodged with the council not later than June 1st. Further particulars and forms of application may be had from the secretary, 38, Old Queen-street, London, S.W.1.

Appointments

BRIGGS, G. O. A., M.B. Camb., M.R.C.P. Lond., Deputy Medical Superintendent at the City Isolation Hospital, Leicester.

COOPE, ROBERT, M.D. Liverp., F.R.C.P. Lond., Hon. Physician to the Royal Liverpool United Hospital, Liverpool Royal Infirmary.

COOPER, T.-V., M.B. Lond., County Pathologist for Dorset.

COPE, C. L., D.M. Oxon., M.R.C.P. Lond., First Assistant in the Department of Medicine (Nuffield Foundation) of the University of Oxford.

CROMB, EDITH E., M.B. Edin., D.P.H., Assistant Maternity and Child Welfare Medical Officer for Derbyshire.

DUNLOP, H. A., M.D., F.R.C.P. Lond., Assistant Physician to the Hospital of St. John and St. Elizabeth, London.

FORSYTH, W. L., M.D. Glasg., D.P.H., Major I.M.S. (retd.), Medical Superintendent at the Royal Northern Infirmary, Inverness.

GAVRON, SYLVIA C., M.B. Cape Town, Second Assistant Pathologist at the Royal Cancer Hospital, London.

MEADOWS, S. P., M.D., M.R.C.P. Lond., Assistant Physician to the Westminster Hospital.

MORRIS, W. MACGREGOR, F.R.C.S. Edin., Hon. Ear, Nose, and Throat Surgeon to the Oxted and Limpsfield Cottage Hospital.

MYERS, GEOFFREY, M.B. N.Z., F.R.C.S. Eng., Resident Surgical Officer at the Hospital for Consumption and Diseases of the Chest, Brompton.

NICHOLSON, M. A., M.B. Brist., Non-resident Medical Officer at the Bristol Dispensary.

PENINGTON, A. H., M.D. Melb., First Assistant Medical Officer at the Surrey County Sanatorium, Milford.

POOLER, N. R., M.B., M.R.C.P. Lond., Hon. Physician to the Royal Hospital, Chesterfield.

SHACKLE, MARGARET P., M.B. Camb., Deputy Medical Superintendent at the Surrey County Sanatorium, Milford.

UNGLEY, H. G., M.D. Durh., F.R.C.S. Eng., Hon. Surgical Registrar to the Royal Waterloo Hospital, London.

YOUNG, C. A., M.B. Lond., Assistant Resident Medical Officer at the Hospital for Consumption and Diseases of the Chest, Brompton.

British Postgraduate Medical School.—The following appointments are announced:—

SHACKMAN, RALPH, M.B. Lond., F.R.C.S. Eng., First Assistant in the Department of Surgery;

SUTHERLAND, J. K., M.D., M.R.C.P. Edin., First Assistant in the Department of Obstetrics and Gynæcology;

RUSBY, LLOYD, B.M. Oxon., M.R.C.P. Lond., Part-time Demonstrator in Clinical Medicine; and

ALCOCK, N. S., M.B. Edin., M.R.C.P. Lond., First Assistant in the Department of Medicine.

Certifying Surgeons under the Factory and Workshop Acts: Dr. E. W. BURSTAL (Lutterworth District, Leicester); Dr. T. H. GILLISON (Ilkeston District, Derby); Dr. W. H. C. SPOONER (Blandford District, Dorset); Dr. C. J. SCOTT (Johnstone District, Renfrew).

Vacancies

For further information refer to the advertisement columns

Aberdeen University.—A. W. Garden Fellowship, each £200.

Accrington, Victoria Hosp.—H.S., £175.

Aylesbury, Royal Buckinghamshire Hosp.—Sen. and Jun. Res. M.O.'s, at rate of £200 and £150 respectively.

Barking Borough.—Asst. M.O., £600.

Barnsley, Beckett Hosp. and Dispensary.—Cas. O., £250.

Birmingham City, Mental Hosp. Dept.—Jun. Asst. M.O., £350.

Birmingham General Hosp.—Res. Surg. Reg., £100–£10–£120.

Birmingham and Midland Eye Hosp.—H.S., at rate of £130.

Birmingham University.—Third Lecturer in Bacteriology and Asst. Bacteriologist in Public Health Laby., £400.

Blackburn County Borough.—Asst. M.O.H. and Asst. School M.O., £600.

Blackburn, Queen's Park Hosp. and Institution.—Res. Jun. Asst. M.O., £200.

Blackburn Royal Infirmary.—Res. H.P., £175.

Bolingbroke Hosp., Wandsworth Common, S.W.—H.S. and Cas. O., each at rate of £120.

Bolton Education Committee.—Asst. M.O.H. and Asst. School M.O., £500.

Caernarvonshire County Council.—Asst. County M.O.H. and School M.O., £600.

Cardiff, King Edward VII Welsh National Memorial Association. Asst. Res. M.O. for North Wales Sanatorium, £200.

Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.—Asst. in Out-patient Dept.

Central Middlesex County Hosp., Acton-lane, Willesden, N.W.—Pathologist, £1100. Also Res. Asst. M.O., £400.

Cairo, Memorial Ophthalmic Laboratory.—Pathologist and Bacteriologist, £E.1200.

Derbyshire County Sanatorium.—Jun. Res. Asst., M.O., £350.

Devon County Council, Hawkmoor Sanatorium, Bovey Tracey.—Res. Asst. M.O., at rate of £250.

Edgware, Redhill County Hosp.—Obstetric Surgeon, £500.

Fareham, Hants, Knowle Mental Hosp.—Second Asst. M.O., £500.

Gloucestershire County Council.—Two Asst. County M.O.H.'s, each £500.

Golden-square Throat, Nose, and Ear Hosp., W.—Two H.S.'s, each at rate of £100. Also Clin. Asst.

Gravesend and North Kent Hosp.—Jun. H.S., £120.

Halifax Royal Infirmary.—Second H.S. for Eye, Ear, Nose and Throat and Med. Depts., at rate of £175.

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Hampstead General and North-West London Hosp., Haverstock Hill, N.W.—Res. Cas. Surg. O., at rate of £100.
Harefield, County (Tuberculosis) Sanatorium.—Jun. Res. Asst. M.O., at rate of £250.
Hastings, Royal East Sussex Hosp.—Asst. Pathologist, £300.
Heston and Isleworth Borough.—Asst. M.O.H. and School M.O., £500.
His Majesty's Colonial Service.—Bacteriologist for Veterinary Dept. in Kenya, £500.
Home Office.—Three Medical Inspectors of Factories, each £750.
Hosp. for Consumption, &c., Brompton, S.W.—Res. M.O., £350.
Hosp. for Sick Children, Great Ormond-street, W.C.—Two Res. H.P.'s and 2 Res. H.S.'s, each at rate of £50.
Hosp. for Tropical Diseases, 25, Gordon-street, W.C.—Two Jun. Hon. Anæsthetists.
Hounslow Hosp.—Anæsthetist, 1 guinea per session.
Huddersfield Royal Infirmary.—H.S. to Eye, Ear, Nose, and Throat Depts., at rate of £150.
Hull City Hosp. for Infectious Diseases, Cottingham.—Res. M.O., £350.
Hull Royal Infirmary.—Second Cas. O., at rate of £150.
Hull and Sculcoates Dispensary.—Res. M.O., £550.
Infants Hosp., Vincent-square, Westminster, S.W.—Hon. Surgeon.
Jewish Maternity Hosp., Underwood-street, E.—Res. M.O., at rate of £50.
Kettering and District General Hosp.—H.P., £150.
King Edward Memorial Hosp., Ealing, W.—Ophth. Surgeon. Also two Hon. Anæsthetists.
Kingston-on-Thames, South Middlesex Fever Hosp.—Asst. Res. M.O., £250.
Lancashire Mental Deficiency Acts Committee.—Additional Asst. M.O., £550.
Leicester Royal Infirmary.—Res. Radiologist, at rate of £200.
Leigh Infirmary, Lancs.—Sen. Res. Surg. O., at rate of £250.
Lincoln County Hosp.—Jun. H.S., at rate of £150.
Liverpool Heart Hosp.—H.P., at rate of £100.
Liverpool Hosp. for Consumption and Diseases of the Chest.—Med. Supt. for Delamere Sanatorium, £800.
London Chest Hosp., Victoria Park, E.—H.S., at rate of £100. Also Surg. Reg.
London, Child Guidance Clinic, Canonbury-place, Islington, N.—Three Fellowships in Psychiatry, each £300.
London County Council.—Asst. M.O.'s, Grade I, £350. Also Asst. District M.O.'s, £280 and £125. Consultant and Specialist Services: Part-time Ear, Nose, and Throat Specialist, £200.
London Jewish Hosp., Stepney Green, E.—Res. M.O. and H.P., each at rate of £150. Also H.S. and Cas. O., each at rate of £100.
London University, King's College.—Demonstrator in Physiology, £100 per term.
Maidstone, West Kent General Hosp.—H.S., £175.
Manchester Ancoats Hosp.—Orthopædic Registrar, £50.
Manchester Royal Eye Hosp.—Out-patient M.O., £200.
Manchester, University.—Asst. Lecturer in Chemical Pathology, £400.
Marie Curie Hosp., 2, Fitzjohn's-avenue, N.W.—Res. M.O., £100.
Metropolitan Hosp., Kingsland-road, E.—Cas. O. and Res. Anæsthetist, £100.
Middlesbrough Education Committee.—Asst. School M.O., £500.
Miller General Hosp., Greenwich-road, S.E.—Cas. O. and H.S., at rate of £150 and £100 respectively.
National Hosp., Queen-square, W.C.—Registrar and Asst. Registrar, each £200.
Newport, Mon., Royal Gwent Hosp.—Sen. H.S. Also Third H.S., £250 and £135 respectively.
New Zealand, New Plymouth Hosp.—Res. Surgeon, £900. Also Radiologist, £850.
Norwich, Norfolk and Norwich Hosp.—H.P., £120.
Oswestry, Robert Jones and Agnes Hunt Orthopædic Hosp.—H.S., at rate of £200.
Oxford, Radcliffe Infirmary.—Hon. Physician to Dept. of Physical Medicine.
Paddington Metropolitan Borough.—Sen. Visiting M.O. for Ante-Natal Clinic, 2 guineas a session.
Plymouth City and General Hosp.—Jun. Asst. M.O., at rate of £250.
Plymouth, Prince of Wales's Hosp., Greenbank-road.—Res. Surg. O., at rate of £225.
Portsmouth City.—Asst. M.O.H., &c., £500.
Preston and County of Lancaster, Queen Victoria Royal Infirmary. Hon. Asst. Physician.
Queen Mary's Hosp. for the East End, Stratford, E.—Appointments, £150–£120.
Reading, Royal Berkshire Hosp.—H.S. to Spec. Depts., at rate of £150.
Royal Cancer Hosp., Fulham-road, S.W.—Two H.S.'s, each at rate of £100. Also Res. H.S. to Radium Dept.
Royal London Ophthalmic Hosp., City-road, E.C.—Two Out-patient Officers, each £100.
Royal National Orthopædic Hosp., 234 Great Portland-street, W.—Res. H.S., at rate of £150.
Royal Naval Medical Service.—Medical Officers.
Royal Northern Hosp., Holloway.—Obstet. Reg., £200. H.S., at rate of £70. Also Gynæcologist in V.D. Dept.
Royal Waterloo Hosp. for Children, &c., S.E.—Hon. Asst. Surgeon. Also H.S., at rate of £100.
St. Bartholomew's Hosp., E.C.—Part-time Chief Asst. in X Ray Diagnostic Dept.
St. Mary's Hosp. for Women and Children, Plaistow, E.—Res. Surg. O. and Res. H.P., at rate of £155 and £150 respectively.
Sheffield Royal Infirmary.—Clin. Asst. to Ophth. Dept. £300. Also Ophth. H.S., at rate of £150.
Southampton Free Eye Hosp.—H.S., at rate of £150.
Southampton, Royal South Hants and Southampton Hosp.—H.P., Res. Anæsthetist, two H.S.'s., and Cas. O., each at rate of £150.
South Eastern Hosp. for Children, Sydenham, S.E.—Hon. Asst. Surgeon.
Southend-on-Sea General Hosp.—Cas. O., at rate of £100.
Southern Rhodesia Medical Service.—Government M.O., £600.
Stafford, Prestwood Sanatorium.—Jun. Asst. M.O., at rate of £300.
Staffordshire County Council.—Second Asst. Bacteriologist and Pathologist, £700.
Stirling District Mental Hosp., Larbert.—Jun. Asst. M.O., £300.
Stockport County Borough.—Asst. M.O., £600.
Stoke-on-Trent, Burslem, Haywood, and Tunstall War Memorial Hosp.—Res. H.S., at rate of £175.
Stoke-on-Trent, North Staffordshire Royal Infirmary.—H.S. (Orthopædic), at rate of £150.
Sunderland Royal Infirmary.—Jun. H.S. and H.P., each at rate of £120.
Tottenham Borough.—Deputy M.O.H., £750.
West Bromwich, Hallam Hosp.—H.P., at rate of £200.
West London Hosp., Hammersmith-road, W.—Additional Hon. Reg. for Throat, Nose, and Ear Dept. Also Hon. Clin. Asst. in X Ray (Diagnostic) Dept.
Wolverhampton Royal Hosp.—Res. Asst. Path. and Res. M.O., £150.
Woolwich and District War Memorial Hosp., Shooters Hill, S.E.—H.P., at rate of £100.

Medical Referee under the Workmen's Compensation Act, 1925, for the Wigan (Circuit No. 6), Altrincham, and Warrington (Circuit No. 7) and Leigh (Circuit No. 8) County Court Districts. Applications should be addressed to the Private Secretary, Home Office, Whitehall, London, S.W.1, before May 27th.

The Chief Inspector of Factories announces a vacancy for a Certifying Factory Surgeon at Barnoldswick (Yorks, W.R.).

Births, Marriages, and Deaths

BIRTHS

BAMFORD.—On April 27th, at Ely, Cambs, the wife of Dr. Brian Bamford—a son.

KNOX.—On April 27th, at St. John's Wood Park, Hampstead, the wife of Dr. Robert Knox—a daughter.

MACLEOD.—On April 26th, at Edinburgh, the wife of Dr. Neil Macleod, of York—a son.

MALLINSON.—On April 28th, at Sittingbourne, the wife of Dr. F. M. Mallinson—a daughter.

PETERS.—On April 26th, at Wimpole-street, W., the wife of Mr. E. A. Peters, F.R.C.S.—a daughter.

ROWLANDS.—On April 30th, at Wimpole-street, W.1., the wife of Dr. John E. Rowlands—a daughter.

SHELDON.—On April 27th, at Sutherland-avenue, W., the wife of Dr. Colin Sheldon, of Reigate, Surrey—a daughter.

SHEPLEY.—On April 27th, the wife of Dr. Wm. H. Shepley, of Warlingham, Surrey—a son.

SHERIDAN.—On May 1st, at Naini Tal, India, the wife of Captain A. M. Sheridan, I.M.S.—a son.

MARRIAGES

GROVE—FRASER.—On April 28th, at St. Ives, Hunts, William Stevenson Grove, M.B., to Helen Baird Clementina Dibdin Fraser.

DEATHS

ABBOT-ANDERSON.—On May 3rd, at Madeira House, Bath, Sir Maurice Abbot-Anderson, C.V.O., M.B. Durh.

BROOKES.—On May 1st, at Hamlet-gardens, Ravenscourt-park, W.6, Frederick William Brookes, M.R.C.S. Eng., L.S.A., in his 81st year.

FURNIVALL.—On May 3rd, at Northam, North Devon, Percy Furnivall, F.R.C.S. Eng., Consulting Surgeon to the London Hospital, aged 71.

LEVENTON.—On April 30th, at Godalming, Lieut.-Colonel Asher Leventon, C.I.E., F.R.C.S.I., I.M.S. (retd.).

LUFF.—On May 1st, 1938, at Limpsfield, Surrey, Arthur Pearson Luff, M.D., F.R.C.P., C.B.E., J.P., Consulting Physician to St. Mary's Hospital, London, aged 82.

NEILL.—On May 2nd, at Oxford, Alexander William Neill, M.D. Edin., Physician Superintendent to the Warneford Mental Hospital, Oxford, aged 58.

PROVIS.—On May 2nd, at Brighton, Francis Lionel Provis, M.R.C.S. Eng., F.R.C.S. Edin., aged 65.

SPEARS.—On April 29th, John Spears, L.S.A., L.R.C.S. Edin., of Worcester Park, formerly of Wimbledon, aged 68.

TELLING.—On April 28th, Walter Henry Maxwell Telling, M.D., F.R.C.P. Lond., J.P., of Leeds.

UNDERWOOD.—On April 29th, at Felstead, Essex, Arthur Cressee Underwood, M.R.C.S. Eng., aged 66.

WILKINSON.—On May 1st, at Boyton, Launceston, Lieut.-Colonel Edmund Wilkinson, F.R.C.S. Eng., D.P.H. Camb., I.M.S., late Medical Officer, Ministry of Health.

WILLIAMSON.—On May 2nd, at Richmond, Surrey, John Williamson, M.B., C.M. Edin.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

LIGUE INTERNATIONALE CONTRE LE RHUMATISME.—At the international congress lately held at Oxford Prof. Ralph Pemberton of Philadelphia was elected president of this league in succession to Dr. R. Fortescue Fox. Dr. J. van Breemen was asked to retain office as secretary and director of the league's international advisory bureau at Amsterdam (Keizersgracht 489). The next congress is to be held in New York in June, 1940.

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NOTES, COMMENTS, AND ABSTRACTS

EMERGENCY TREATMENT

BY A CLAIMS OFFICIAL

IN order to ensure that medical practitioners and hospitals receive payment for giving emergency treatment after road accidents, the Road Traffic Act of 1934 made the insurance companies responsible, irrespective of the legal liability of the motorist to the injured person, for a fixed amount of 12*s.* 6*d.* for each person treated. This fee is claimable by the first doctor rendering treatment or by the hospital to which the injured person is first removed after the accident. It is further stipulated that any claims must be made within seven days of the rendering of treatment, by registered letter sent to the owner of the motor vehicle. When this provision is not complied with the vehicle owner or his insurers are entitled to refuse payment. In practice, however, it will be found that by mutual agreement between insurers, little or no advantage will be taken of the time limit and the Accident Offices Association have agreed that in the case of hospitals they will not insist on the time limit; neither need claims be made by registered post. Although there is no definite ruling for private practitioners, it is unusual for the insurance companies to refuse payment of an emergency treatment account sent after the expiry of the time limit or otherwise not within the terms of Section 17 (2) of the Road Traffic Act, 1934.

The British Medical Association has published since the passing of the Act a special form for the use of doctors on which to make claims for emergency treatment, and these forms may be obtained in blocks for convenience. In addition to the amount of 12*s.* 6*d.*, a doctor called out to an accident may make a further charge for travelling of 6*d.* per mile in excess of two miles. If more than one person is treated at the same spot the mileage allowance can be claimed only once.

When an accident involves a single motor vehicle and a pedestrian, the claim for emergency treatment should of course be sent to the owner of the vehicle or direct to his insurers if the name of these is known, but when more than one is involved some doubt may arise as to the proper quarter to which the claim should be addressed. As a general guide, accounts relating to injuries sustained by passengers in either or any of the vehicles should be rendered to the vehicle owner. When more than one vehicle is concerned and treatment is given to a person other than a passenger, the account may be sent to either vehicle owner, since in these instances the insurers usually share the cost of emergency treatment.

THE RED CROSS IN CHINA

IN a letter from Canton, dated March 29th, Dr. WILLIAM W. CADBURY, F.A.C.P., writes:—

As the months go by and the unprecedented attacks upon non-combatants continue, the Chinese people are hardening themselves to resistance. Since the fall of Nanking the morale of the people and their armies has been steadily improving, and this is especially evident in the reorganisation of the Red Cross and the National Health Service.

The present head of the Wei Shang Shue, or commissioner of health, is Dr. F. C. Yen, until recently director of the National Medical College of Shanghai. Dr. Yen is a graduate of Yale University and an outstanding leader of the medical profession of China. At the head of the Chinese Red Cross, as director, stands Dr. Robert Lim, until recently professor of physiology at the Peiping Union Medical College. He is a graduate of Edinburgh University and is well known for his ability as an organiser. These two leaders have the confidence of all who know them.

As branches of the Chinese Red Cross, international committees have been organised to meet special emergencies. Thus in Shanghai work for refugees was largely handled by a special refugee committee of the International Red Cross. Another committee has been organised in Hankow and one in Canton. In the latter city the whole administration of the provincial government is organised under a council of which the commander of the 4th Route Army and the provincial governor are respectively chairman and vice-chairman, thus uniting the military and civil authority. This council operates through eight departments, one of which is the medical relief department. The chairman, Dr. Cheung Kin, is head of the Army Medical Corps; he studied in Germany. Dr. Tso Waiming, a graduate of England, is vice-chairman and is commissioner of health for the province. Dr. Jee Quong-to, an American graduate, secretary of the department, is director of health for the city of Canton. Thus these three men combine the medical ideals of three leading countries.

In close connexion with this department is the Canton Red Cross Association. This is devoting its efforts primarily to first-aid relief along the provincial railways where hundreds of civilians are being killed or injured by the almost daily air raids of Japanese bird-men. The Canton International Committee of the Chinese Red Cross is composed of Chinese and foreigners and serves as a medium between China relief agencies and the outside world.

Two thousand additional beds are to be equipped for use by existing mission hospitals in the province of Kwangtung. Refugees from the north are housed in five camps, and a joint refugee committee of Chinese and foreigners has been appointed by the Government to render every possible help to these unfortunates. Thus, as the conflict drags on, Chinese leaders are learning how to organise, both in military affairs and in the care of the war victims. To those who know the Chinese people nothing could seem more worthy of the generosity of the world's medical profession than aid in the rehabilitation of China's wounded and suffering millions. The agencies now administering relief are well organised and efficient, and money would not be wasted. Send contributions to the Lord Mayor's Fund in London, to the American Red Cross Fund, now being raised at the request of President Roosevelt, or to the international Red Cross committees in Canton, Hankow, or Shanghai.

A POCKET DIARY AND MEDICAL DIGEST

KEESING'S MEDICAL DIGEST, which has been published for three years on the Continent but is new to this country, aims not only at supplying the busy practitioner with a convenient medical diary but at keeping his knowledge up to date with little trouble to himself. It consists of a loose-leaf binder about 6 by 4 in. containing pages for daily visiting-lists, obstetric engagements, and cash accounts on the lines of the standard medical diaries, but its main feature is a section of summaries of current medical literature. Abridged versions of about twenty papers of general interest from the world's journals are supplied each month to be inserted in the cover, and with them a revised index which will be continuous for ten years. The summaries for March were taken from the journals of about three months previously. The translations are adequate; and obvious errors, such as "the blood pressure was hyperchromatic" (p. 65), are rare. The pages do not open flat, but the paper is pleasant to write upon and the printing clear. It is pardonable for us to wonder whether the practitioner would not do better to take the weekly journals of his home country about with him in his car; but clearly there are occasions, as when awaiting a colleague for consultation, when abstracts of pocket size are more conveniently read. The subscription is a guinea a year, and the offices of the company issuing the digest are at 1, Regent-street, London, S.W.1.

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A POLICE INQUIRY

A female child, aged 10–14 days, was found abandoned at the central railway station, Newcastle-upon-Tyne, on April 14th. The infant had on the scalp, two and a half inches above the right eyebrow, a healing vertical wound half an inch long, possibly caused by forceps at birth. The Newcastle police, who are trying to trace the identity of this child, would be glad to hear from the doctor who delivered this baby. The child had received some medical attention and is presumed to have left some home or institution on the night of April 13th or early on the 14th.

NEW PREPARATIONS

LIBBY'S HOMOGENISED FOODS.—Having devised a method of homogenisation that reduces fibres to minute particles the Chicago firm of Libby, McNeill and Libby (Forum House, 15, Lime-street, London, E.C.3) offer a variety of vegetable and fruit mixtures for infants and invalids. The fine division of the foods exposes a larger area to digestive enzymes, and increases the rate and completeness of absorption; but the bulk remains the same. Three combinations of vegetables are prepared (the components being peas, beet, asparagus, beans, pumpkins, tomatoes, spinach, and carrots) and they are recommended as a rich natural source of vitamins and mineral salts. There is also a cereal (composed of whole wheat, soya bean, and milk), a fruit preparation (prunes, pineapple juice, and lemon juice) with a laxative action, and a soup (tomatoes, carrots, celery, liver, barley, and onions). These foods can be readily heated in the enamel-lined containers in which they are supplied and are intended both as a supplement to the normal infant's diet and as a source of nourishment in colitis, gastro-enteritis, and other disorders of older children and adults. Since they cause no intestinal irritation the vegetables have been given to babies three months of age, and the cereal as early as seven weeks.

A booklet on Vitamin Products reaches us from the BRITISH DRUG HOUSES Ltd. (Graham-street, N.1). It summarises recent scientific advances and describes the B.D.H. preparations available.

The REGISTER OF VETERINARY SURGEONS for 1938 contains as usual the report of the council of the Royal College of Veterinary Surgeons which makes it clear that any apparent diminution in the number of veterinary graduates is due to the lengthening of the course of study from four to five years. The first qualifying examination under the new regulations was held last July. The Register may be had from the secretary of the College, 10, Red Lion-square, London, W.C.1, for 5*s*.

Medical Diary

May 9th to May 15th

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY.

Therapeutics and Pharmacology. 5 P.M., annual general meeting. Mr. F. G. Young, Ph.D.: Relationship of the Anterior Hypophysis to Diabetes Mellitus.

Psychiatry. 8.15 P.M., annual general meeting. 8.30 P.M. (with the Section of Neurology), Dr. W. Mayer-Gross, Dr. Macdonald Critchley, and Dr. J. G. Greenfield: The Presenile Dementias—Symptomatology, Pathology, and Differential Diagnosis.

WEDNESDAY.

Surgery: Subsection of Proctology. 5 P.M., annual general meeting. Mr. Henry Wade and Mr. Lionel Norbury: Urinary Fistulæ in Relation to the Colon and Rectum. Mr. G. Gordon-Taylor, Dr. Cuthbert Dukes, and Mr. Lawrence Abel will also speak.

FRIDAY.

Clinical. 5.30 P.M. (cases at 4.30 P.M.), Mr. Duncan Fitzwilliams: (1) Ruptured Spleen. Dr. Bernard Myers: (2) Gaucher's Disease of the Lungs. Dr. Ernest Fletcher: (3) Infective Arthritis associated with Chronic Pulmonary Tuberculosis. (4) Monarticular Arthritis, ? Diagnosis. Mr. A. Simpson-Smith: (5) Neuroblastoma of Sacrum, 2½ Years after Removal.

SATURDAY.

Physical Medicine. 10 A.M., annual general meeting at Droitwich. Dr. J. W. T. Patterson: Treatment by Brine Baths. 2.15 P.M., Visit to baths, hospitals, and clinic.

BRITISH ASSOCIATION OF RADIOLOGISTS.

FRIDAY.—10 A.M. (Whitla Medical Institute, Belfast), Dr. R. M. Beath: presidential address. Noon, Prof. P. Flemming Møller (Copenhagen): Chronic Fluorine Poisoning as seen from a Radiological Standpoint. 2.15 P.M., Dr. T. Garratt Hardman: A Position for Radiography of the Fourth Ventricle. Dr. J. F. Brailsford: Brodie's Abscess and its Differential Diagnosis. Dr. Peter Kerley: Syphilitic Aortitis and Aneurysm of the Aorta.

SATURDAY.—10 A.M., Dr. S. Cochrane Shanks: Four-area Method of X Ray Treatment of Tinea Tonsurans. Dr. J. Ralston Paterson and Miss Margaret Tod: The Radium Treatment of Angiomata in Children. Dr. R. McWhirter: The Treatment of Certain Non-Malignant Conditions by X Ray and Radium Therapy.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, W.

MONDAY.—8 P.M., annual general meeting. 8.30 P.M., Sir Henry Gauvain: Planning a Hospital. (Annual oration.)

HARVEIAN SOCIETY OF LONDON.

THURSDAY.—8.30 P.M. (26, Portland-place, W.), Mr. Rainsford Mowlem: Plastic Surgery.

PADDINGTON MEDICAL SOCIETY.

TUESDAY.—9 P.M. (Paddington Tuberculosis Dispensary, 20, Talbot-road, W.), discussion on the Problems of General Practice.

SOUTH-WEST LONDON MEDICAL SOCIETY.

WEDNESDAY.—9 P.M. (Bolingbroke Hospital, Wandsworth-common), Dr. Henry Yellowlees: Psychological Growing Pains.

WEST KENT MEDICO-CHIRURGICAL SOCIETY.

FRIDAY.—8.45 P.M. (Miller General Hospital, Greenwich), Mr. Myles Formby: Some Common Oto-laryngological Conditions; Aids to their Diagnosis and Treatment.

MEDICAL SOCIETY OF INDIVIDUAL PSYCHOLOGY.

THURSDAY.—8.15 P.M. (11, Chandos-street, W.), Dr. A. T. Macbeth Wilson: Psychological Factors in Organic Disease.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane-road, W.

TUESDAY.—4.30 P.M., Dr. H. Gardiner-Hill: Diseases of the Ductless Glands.

WEDNESDAY.—Noon, clinical and pathological conference (medical). 2 P.M., Mr. E. J. King, Ph.D.: Carbohydrate Metabolism and Diabetes. 3 P.M., clinical and pathological conference (surgical).

THURSDAY.—2.15 P.M., Dr. Duncan White: radiological demonstration. 3.30 P.M., Colonel L. W. Harrison: Gonorrhœa in Women.

FRIDAY.—2 P.M., clinical and pathological conference (obstetrics and gynæcology).

Daily, 10 A.M. to 4 P.M., medical clinics, surgical clinics and operations, obstetrical and gynæcological clinics and operations.

ST. MARY'S HOSPITAL, W.

TUESDAY.—5 P.M. (Institute of Pathology and Research), Dr. R. A. Young: The Treatment of Pneumonia.

NATIONAL HOSPITAL FOR DISEASES OF THE HEART, Westmoreland-street, W.

TUESDAY.—5.30 P.M., Dr. B. T. Parsons-Smith: Angina Pectoris.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.

THURSDAY.—2 P.M., Dr. B. E. Schlesinger: Pulmonary Tuberculosis in Childhood. 3 P.M., Dr. D. N. Nabarro: The Cerebro-spinal Fluid.

Out-patient clinics daily at 10 A.M. and 2 P.M.

ST. GEORGE'S HOSPITAL, S.W.

THURSDAY.—5 P.M., Dr. Antony Feiling: neurological demonstration.

LONDON SCHOOL OF DERMATOLOGY, 5, Lisle-street, W.C.

MONDAY.—5 P.M., Dr. W. N. Goldsmith: Acneiform Eruptions.

TUESDAY.—5 P.M., Dr. J. E. M. Wigley: Napkin Area Eruptions.

THURSDAY.—5 P.M., Dr. W. Griffith: Bullous Eruptions.

FRIDAY.—5 P.M., Dr. G. Duckworth: Psoriasis.

ST. JOHN CLINIC AND INSTITUTE OF PHYSICAL MEDICINE, Ranelagh-road, S.W.

FRIDAY.—4.30 P.M., Mr. T. J. Phillips: Physical Medicine in Diseases of the Eye.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY to SUNDAY.—MAUDSLEY HOSPITAL, Denmark-hill, S.E., afternoon course in psychological medicine.—ST. JOHN'S HOSPITAL, 5, Lisle-street, W.C., afternoon course in dermatology. (Open to non-members.)—PLASTIC SURGERY (various hospitals), Wed. and Thurs., all-day course.—PRINCESS BEATRICE HOSPITAL, Richmond-road, S.W., Sat. and Sun. course in general surgery.

MANCHESTER ROYAL INFIRMARY.

FRIDAY.—4.15 P.M., Mr. D. M. Sutherland: clinical demonstration.

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ADDRESSES AND ORIGINAL ARTICLES

THE CLINICAL FEATURES OF CENTRAL PAIN *

By George Riddoch, M.D. Aberd., F.R.C.P. Lond.

PHYSICIAN TO THE LONDON HOSPITAL AND DIRECTOR OF THE NEUROLOGICAL DEPARTMENT; PHYSICIAN TO OUT-PATIENTS, NATIONAL HOSPITAL, QUEEN SQUARE, LONDON

No excuse need be offered for reopening the discussion on pain, provided that by doing so fresh light can be thrown on some of the problems it presents. For pain is a subject of perennial interest, as old as the study of medicine itself, and our understanding of the physiological and anatomical mechanisms which underlie it is still imperfect.

Pain is an affective experience, which among sensations, is, when evoked, prepotent; and is unique in that it is the only aspect of sensation which is accompanied by endocrine, autonomic, and motor reactions of a protective kind. Yet, because of its compelling and obtrusive characters, it is experienced only intermittently in the life of the healthy individual, its neural mechanisms lying dormant, but vigilant, ready to be awakened if the tissues of the body are threatened. The means by which it is kept under control has for long been one of the most discussed subjects in neurology, but without giving birth to a view that is generally acceptable.

Pain of central origin was chosen as the subject for these lectures because, whilst in recent years it has been absorbing the attention of neurologists in many countries, it is, except when of thalamic origin, less known in general medicine. It was therefore thought that a review of the clinical and pathological evidence, which has been steadily accumulating, and is recorded chiefly in neurological literature, might be of general interest.

By central pain is meant spontaneous pain, and painful over-reaction to objective stimulation, resulting from lesions confined to the substance of the central nervous system, including dysæsthesiæ of a disagreeable kind.

Central Pain with Thalamic Lesions

It is convenient to begin with pain from lesions of the optic thalamus since, of central pains, it is not only the most common but has been most fully studied.

Dejerine and Roussy [10] gave the first description of the thalamic syndrome which was later elaborated by Roussy in his "thèse de Paris." The chief features of the syndrome as described by them are as follows. On the side opposite to the lesion there are (1) acute, persistent, or paroxysmal pain, which is often intolerable, and is little affected by analgesics; (2) a variable reduction of cutaneous sensation, a greater loss of deep sensibility and some astereognosis; (3) slight hemiataxia; (4) slight transient hemiplegia, without contracture; and (5) choreic and athetoid movements. According to Roussy,[52] the pain and sensory loss alone are due to the thalamic lesion.

Head and Holmes [31] by the use of measured stimuli more fully analysed the sensory phenomena in thalamic disease, and came to the conclusion that the essential feature is a tendency to react excessively to unpleasant and, occasionally, to pleasant stimuli. This view has been amply confirmed by subsequent observers. So-called spontaneous pain occurs in a considerable proportion of such cases.

SPONTANEOUS PAIN

It varies from uncomfortable paræsthesiæ to pain of great intensity and diversity, but is often described as aching, shooting, or painful burning and may defy description. It is referred to deep or superficial tissues, is usually diffuse, and may be intermittent or persistent with paroxysmal exacerbations. It is notoriously intractable to treatment. The whole of the opposite side of the body may be the seat of pain or part of it may escape. Frequently the pain varies in position from time to time and it may change in character, for no apparent reason, during the course of the illness. As a rule it is aggravated by almost any form of somatic or visceral stimulation that can disturb consciousness, as well as by emotion, and is commonly associated with anxiety, which may be extreme. A state of apprehension of the same degree, as the result of pain of central origin, is met with only in some cases of concussion of the cervical spinal cord, in the acute stage, and is reminiscent of the dread of interference, which is familiar in patients suffering from severe causalgia or painful phantom limbs.

OVER-REACTION: HYPERALGESIA AND HYPERPATHIA

Whilst spontaneous pain may be absent in the thalamic syndrome, excessive reaction to objective stimulation of the affected parts of the body is, as Head and Holmes [31] insisted, the essential and constant feature. But in reality, as they believed, spontaneous pain is merely a further development of the same abnormality, for pain cannot occur without some form of stimulation. The characters of over-reaction are as follows.

Pain or discomfort is, in general, evoked by almost any stimulus which is capable of arousing a sensation. The threshold may be normal, increased, or diminished. Over-response without sensory loss is called hyperalgesia and, when associated with diminished sensibility to the form of stimulation which excites the painful reaction, hyperpathia.[20] But, whatever the threshold may be, the sensation evoked is abnormal. The painful sensation develops explosively. There is usually little relation between the strength of the stimulus and the amount of sensation excited; it is nearly "all or nothing." The pain is usually intensely disagreeable and unbearable and often evokes violent emotional and defensive motor reactions. It has a prolonged after-effect; that is to say, it persists for an unusual time after stimulation has ceased. Localisation of the pain is defective and irradiation over the whole half of the body is common. It might be added that, at all events when sensation is diminished, the pain is usually not simple but is complex and has frequently a thermal quality.

All stimuli are not equally capable of evoking pain and discomfort in thalamic syndromes. Those which are endowed with affective qualities are most potent and, in the presence of sensory loss, are, of somatic stimuli, alone effective. "The nearer a sensation approaches pure discomfort, the more certainly will the response be exaggerated on the affected side of the body." [31] But even in this category the potency varies, for deep pressure is more effective than pinpricks. Thus in Head and Holmes's series of

* The Lumleian lectures for 1938, delivered before the Royal College of Physicians of London on March 14th and 17th.

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cases there was over-reponse to measured prick in 20 of 22, and of them the threshold was identical on the two sides of the body in 13, raised in 9, and lowered in none on the affected side. But deep pressure evoked excessive discomfort in all, the threshold being lowered in 15, especially in the hand and foot, was the same in 6, and raised in 3. In fact, pressure with the algometer was capable of evoking discomfort in cases in which there was complete analgesia to pinprick. Pressure with a blunt object is essentially different from pinprick in that it causes discomfort and crude diffuse pain rather than acute localised pain.[31] The increasing massiveness of the sensation it evokes with the greater threat it entails is undoubtedly a factor in its effectiveness.

With extremes of heat or cold, whether thermal sensibility is preserved or not, discomfort, if evoked, is greater on the affected side. The capacity to cause discomfort is greater with cold than with heat. Thus Head and Holmes [31] found that, in cases with a normal threshold, a warm stimulus was not described as hotter than on the normal side until the temperature was between 40° C. and 45° C. On the other hand, all but the mildest cold stimuli were said to be colder and more unpleasant.

The strength of the thermal stimulus necessary to elicit pain or discomfort depends upon the degree of sensory loss, but, even with complete thermo-anæsthesia, extremes of heat or cold (water about 50° C. or cold below 15° C. or melting ice) may evoke intensely disagreeable sensations, which, however, are devoid of any thermal quality.

In cases in which thermal sensibility is preserved, or only partially lost, the excessive response evoked is usually translated by the patient into terms of greater heat or cold whilst, on analysis, it is clear that it is only discomfort that is increased. Sometimes the sensation described is compound, as for example, in one of my cases in which hot water not only felt "hotter" but excited also a disagreeable bursting sensation under the skin. In this case, as in many others, the patient was especially intolerant to cold on the affected side. Cold water applied to his left side gave him a "shock, like electricity," and even a drop of rain on his left hand was sufficient to produce a violent reaction. In a case of Foerster's,[20] a drop of rain on the face caused violent pain like a wave of boiling water, and in another, burning pain was evoked, only on the affected side, on drinking cold water or passing urine.

Scraping and tickling are extremely uncomfortable and, if sensibility to light touch is unimpaired, even gentle moving contact, especially over hairy parts, may be intolerable. For example, one of my patients was so hypersensitive to touch that she could not bear to have anyone walk with her near her affected side. Even the contact of her clothes was disagreeable and dressing and undressing was a dreaded ordeal.

Stimuli which normally have no obvious affective quality may have its presence revealed in the thalamic syndrome. For example, the vibrations of a large tuning-fork which, on normal parts, appear to be neutral may give rise to discomfort, and movement of a limb may be very painful.

Like extremes of temperature and deep pressure, visceral stimulation is peculiarly efficacious in evoking excessive discomfort. Thus, testicular pressure is far more disagreeable on the affected side and may be capable of causing severe diffuse pain on the affected side even when there is gross analgesia. Referred pain from thoracic and abdominal visceral disease, in thalamic cases, also tends to irradiate widely. According to Foerster,[20] whereas pain on the normal side is more or less restricted to the dermatomes which correspond to the diseased organ, on the side affected by the thalamic lesion it is not only more severe but tends to spread over the whole half of the body.

The effect of persistent stimulation from active somatic lesions, such as a sore in the skin or a deep abscess, is illuminating and is well exemplified by one of Foerster's cases in which there was no spontaneous pain or hyperpathia until a few days after the patient burned his foot. Characteristic pain and over-reaction to stimulation over the whole side of the body then developed, and did not disappear until the burn had healed.

As a rule, somatic stimuli can cause or aggravate pain only when applied to the affected side. Sometimes, however, it is found that stimulation of the normal side may also give rise to exacerbations of pain (synæsthesalgia). Further, stimuli, to be effective, need not then be noxious, although such are most potent; for those which are neutral or even pleasant in the stimulated part may evoke pain on the affected side.[20] This phenomenon of synæsthesalgia led Foerster to conclude that both optic thalami are in close functional relationship.

As has been well known since the reaction was first described by Head and Holmes,[31] thalamic pain can be caused or aggravated, not only by somatic and visceral stimulation, but also by excitation of the organs of special sense. Thus a sudden bright light, a loud or unexpected noise, and less often an intense smell or strong taste,[20] particularly if unpleasant, may excite pain limited to the affected side of the body. Sad or distasteful music may cause a violent reaction as in Case 11 of Head and Holmes,[31] in which the patient had a horrid feeling on the affected side when the choir sang, and her leg, which was the seat of choreiform movements, screwed up and began to shake.

There has been much discussion on the mechanism by which these abnormal reactions from stimulation of the special senses are evoked—whether they are the result of direct action on the optic thalamus of impulses derived from the particular end-organ of special sense or not. According to Foerster, the optic thalamus is the meeting place for afferent impulses of every kind and from every source; in fact, it is the only situation in the central nervous system in which a general sensory convergence occurs. It is not therefore surprising that sensory impulses, whatever their origin, can evoke a similar reaction.

Ajuriaguerra [1] and Baudouin and Schaeffer,[4] nevertheless assert that since visual or auditory impulses do not possess affective qualities, they cannot by themselves evoke a painful over-response. According to these authors, the increase of pain on the abnormal half of the body excited, for example, by a loud noise, is the result of painful impulses derived from excessive stimulation of the ear-drum. They forget, however, that somatic stimuli which are normally neutral, such as light touch or passive movement, may sometimes produce severe pain.

But quite apart from the probable effectiveness by themselves of auditory impulses, the emotion they arouse, if the noise is disagreeable to the individual, must play a part in exciting the diseased thalamus to over-reaction; for it is notorious that anxiety and distress can be as potent, in this respect, as affective peripheral stimulation.

Head and Holmes [31] were also the first to point out that a general state of discomfort, ill-being, or

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malaise and, less seldom, of pleasure or well-being, may be exaggerated on the affected side.

Over-response to painful and uncomfortable stimuli, with or without the presence of spontaneous pain, is admitted by all observers to be the characteristic feature of the thalamic syndrome. But over-response to pleasant stimuli may also occur, although only in a minority of cases. Head and Holmes [31] found that in several of their patients warmth (34° C.) was more pleasant on the affected than on the normal side. Further, in a few cases with thermo-anæsthesia, a warm object, when applied over a large surface, evoked pleasure but without a sensation of warmth. Foerster [20] has confirmed these observations and also found that gentle moving contact on the affected skin may be unusually pleasant.

Pain and discomfort are generally prepotent over pleasant sensations; but the possibility of pleasurable sensations, if massive enough, controlling pain was demonstrated in one of Foerster's patients. In this case spontaneous, violent burning pain on one side of his body was abolished and replaced by an agreeable sensation, when the patient was immersed in a lukewarm bath. Such examples must be exceedingly rare, but that they do occur is of great interest.

This case naturally leads to the consideration of clinical observations on the inhibition of thalamic pain. Whilst the usual response to painful or uncomfortable stimulation of the affected side is aggravation of the spontaneous pain, often over the whole half of the body, nevertheless there appear to be exceptions to this rule. Thus, Ehrenwald,[13] in one case, found that intense local excitation, as by firm pinching or faradisation, caused temporary disappearance of the spontaneous pain, except in the part directly stimulated, where it remained and with increased intensity. The same patient accidentally fractured his forearm on the affected side and, during the period of local pain from the fracture, the spontaneous pain was elsewhere inhibited. The same observer also discovered that the sensation of itching, produced by the application of an irritating powder, was sometimes associated with abolition of pain for so long as the sensation of itching lasted. These examples show that occasionally irradiation of pain can be controlled by local stimulation but at the expense of increased pain in the stimulated area.

Not only irradiation of pain but pain itself, if not severe, may be temporarily inhibited as the result of local stimulation. Thus, in a case of Foerster's,[20] scratching the anæsthetic skin evoked a disagreeable sensation which could be abolished by simultaneous light contact of the neighbouring normal skin. This interesting observation recalls the examples cited by Rivers and Head [51] of the control of pain and its irradiation in a recovering peripheral nerve area by simultaneous stimulation of contiguous normal and abnormal parts. The substitution of a pleasant sensation for pain by the application of warmth in Foerster's patient quoted above is another example of inhibition of one form of sensation by another and again brings to mind the experiment of Rivers and Head [51] in which the glans penis was gradually dipped into water at 45° C. A sensation of pain was first evoked but was replaced by one of cold, when a part containing cold spots was immersed. As soon as the water reached the corona, which is endowed also with heat, as well as with cold and pain spots, the sensation of cold was in turn suppressed and was replaced by a pleasant sensation of heat. As these observers concluded, such interaction between excitation and inhibition of impulses underlying different sensory qualities forms the basis of integration in sensation.

SENSORY LOSS WITH THALAMIC LESIONS

The only constant feature of the thalamic syndrome is over-response to stimulation with or without "spontaneous" pain. The involuntary movements, slight hemiparesis, and even the sensory loss included in the original description of Dejerine and Roussy [10] may be absent. Although Head and Holmes [31] found some sensory impairment (not necessarily to painful stimuli) in all their cases, varying from only a measurable change to severe loss, they insisted that the degree of over-reaction bore no relationship to the amount of loss of sensation. "But the existence of sensation of approximately normal acuteness opens the way for more impulses that can evoke an excessive response." [31]

Usually postural sensibility is more affected than cutaneous, but all forms may be diminished and many different sensory dissociations are found. Impairment of pain when present is always greater for pin-prick than for deep pressure. In some cases, there is no loss to pain, even with graded stimuli, but definite disturbance of other forms of sensation.[20] Sensibility to heat and cold may be unchanged, diminished, or abolished. With complete thermo-anæsthesia, discomfort may still be evoked by extremes of heat or cold, but the affective response is the same for both and does not possess thermal qualities. If, however, the sensory loss is not severe, there is no confusion between heat and cold, although discomfort is present.[31]

Irradiation of pain appears to be greatest when there is loss of the sense of localisation, but diffusion may become extensive without such loss, especially if spontaneous pain has been severe and continuous, and the patient's resistance to it is diminished.

Rarely no sensory loss can be detected in spite of the characteristic over-response (Lhermitte,[38] Baudouin,[4] Foerster.[20]) Thus I have had a patient under my care in whom, after a stroke, impairment of sensibility to pain, heat, and cold on his left side was for a time associated with hyperpathia. Sensibility to cold recovered before that to heat and, four days after his stroke, when his left hand was still insensitive to heat, cold—even from a drop of rain—evoked a violent reaction like an electric shock. Later, on the same day, sensibility to heat began to return and was also associated with hyperpathia. When, however, the patient's condition became stationary all sensory loss had disappeared but the over-response to thermal and painful stimulation persisted.

At the other extreme are cases in which anæsthesia, analgesia, and thermo-anæsthesia are so severe that only massive stimulation, as for example from strong pressure, water at 50° C. or below 15° C. in a large vessel, can evoke a response, which is then one of diffuse unilateral discomfort or pain. In such cases spontaneous pain may be as excessive as when sensory loss is slight. As has already been mentioned in a few cases of this kind recorded by Head and Holmes,[31] pleasure could also be evoked by the application of warmth over a large surface on the affected side but without a thermal sensation. Such examples reveal the elementary and non-specific character of affect.

THE DISTRIBUTION OF PAIN AND SENSORY LOSS

When there is diminished sensibility to pain, as there is in the majority of cases, the area of sensory

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loss may cover the whole affected side of the body or be confined to part of it, usually upper limb and face or lower limb and abdomen. The same is true of spontaneous pain and over-reaction. According to Lhermitte,[38] pain is most often complained of in the upper limb, especially its distal part.

Foerster [20] has insisted that even when the analgesia is extensive it is not uniform, but is greatest in the distal parts of the limbs, diminishing towards the girdles, and in the lateral part of the trunk, diminishing towards the middle line. In the limbs, too, it is often most on the ulnar part of the hand and forearm and on the lateral or peroneal side of the leg and foot. In other cases the loss is global or circular, as in hysterical analgesia, but the upper borders are not sharp nor tend to be limited by joints or other prominent anatomical landmarks. Further, the skin round the mouth and eye, anus, perineum, and genitals is relatively less affected.

CERTAIN ANATOMICAL AND PATHOLOGICAL OBSERVATIONS, WHICH BEAR UPON THE OCCURRENCE AND DISTRIBUTION OF THALAMIC PAIN AND OVER-RESPONSE

Pain is not an inevitable consequence of lesions of the thalamus, for it is often absent, especially with tumours. In addition, characteristic spontaneous pain and over-reaction appear to be independent of the presence or absence of analgesia, short of complete abolition of all sensation on the affected side when, presumably, the sensory part of the thalamus is entirely destroyed.

Of the factors which play a part in determining whether pain will develop or not, only the situation and cause of the lesion will be considered at this stage.

As to the situation of the lesion, it is generally agreed (Dejerine and Roussy,[10] Head and Holmes,[31 33] Sager,[12] Foerster,[20] Ajuriaguerra,[1]) that for thalamic pain damage to the lateral nucleus is essential. It is in the dorsal part of this nucleus that cortico-thalamic, presumably inhibitory fibres terminate and, according to Poljak [48] they are derived mainly from the post-central cortex. Further, in those cases of thalamic pain and over-response without sensory loss which have been subjected to detailed histological examination the lesions have been confined to the lateral nucleus.[1] At the same time it must be admitted that occasionally damage limited to this nucleus has been found in cases in which pain was absent.[17] The lateral nucleus is supplied chiefly by the lenticulo-optic artery.[18]

According to Ajuriaguerra,[1] when pain is accompanied by sensory loss, the lesion also involves the ventral nucleus.

Judged by present pathological evidence, the median or internal nucleus and the smaller anterior nucleus do not appear to possess sensory functions.

In view of the experimental researches of O. Sager [12] and of Dusser de Barenne [11] in monkeys, clinicians have been interested in the possibility of representation of different parts of the opposite half of the body in the lateral nucleus. According to Sager's [12] work on the ape, in the sagittal direction the area for the upper limb corresponds to the whole lateral part of the nucleus, that for the upper limb to the middle and caudal regions, and that for the face especially to the caudal portions. Dusser de Barenne,[11 12] from his strychnine experiments, in general arrives at the same conclusions.

The limitation of pain, over-reaction, and sensory loss to a part of one-half of the body in a proportion of clinical cases suggests that there is also somatotopical representation in man, but satisfactory histological evidence is not yet available. Ajuriaguerra,[1] however, quotes three suggestive cases of pain limited to part of the body with pathological data.

In addition to the situation of the lesion the importance of the nature of its cause has been long recognised.

All are agreed that vascular lesions, especially softenings of the lateral nucleus, more often give rise to pain than lesions of other kinds. Lhermitte [39] has asserted that, as a rule, pain is apt to appear earlier with hæmorrhages than with vascular occlusions.

Tumours of the optic thalamus are notoriously painless in comparison to vascular lesions. Imber [36] found the thalamic syndrome to be rare in a series of 45 cases of thalamic tumour, and in a review of a number of reported cases of glioma, Ajuriaguerra [1] discovered that pain occurred only in 3. This must have been the striking experience of all neurologists and it raises the question of the importance not only of the comparative destructiveness of lesions of different kinds, but also of tissue reaction in relation to the development of pain.

Inflammations are also relatively painless, as well as traumatic lesions, although the thalamic syndrome from war wounds has been described by Guillain,[25] Faure-Beaulieu,[15] and Leri.[37]

Central Pain with Brain-stem Lesions

In the past sixty years many cases of pain of pontobulbar origin have been recorded. It must however be understood that pain and other disagreeable sensations are symptoms in only a small proportion of cases of central lesion in these situations. That it occurs in the brain-stem as often as it does is mainly due to the presence of the descending sensory nucleus of the fifth and perhaps also to some extent because at least a proportion of the fibres of the spinobulbothalamic tract appear to ascend at this level by series of short relays in the reticular grey substance.

The striking fact that no case of pain of mesencephalic origin has been reported may well be connected with the absence of sensory nuclei in this situation.

Bulbar are more common than pontine cases. Garcin,[23] who has made a special study of the literature of pontobulbar pain, discovered 56 examples of bulbar origin as against 28 of pontine origin, in all of which there were adequate clinical and pathological descriptions. In his analysis, the order of frequency of various lesions of the bulb were: (1) vascular, which constituted the majority, especially thrombosis of the posterior inferior cerebellar artery; (2) syringobulbia; (3) disseminated sclerosis; and (4) pontobulbar tumours. Of the 28 cases of pontine lesion, most (13) were of tumours, and it may be significant, from the point of view of tissue reaction, as a causal factor, that tuberculomas (8) were predominant.

The syndrome of thrombosis of the posterior inferior cerebellar artery, with which bulbar pain is most often associated, includes analgesia and thermo-anæsthesia in the trigeminal area, on the side of the lesion, and in the trunk and limbs on the opposite side, which are the result of damage respectively to the descending nucleus of the fifth and the crossed spinothalamic tract.

When pain or other disagreeable sensations occur within the analgesic areas, they tend to be referred more to the trigeminal region than to the opposite

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side of the body and limbs. Thus in the case of a man of 57, pain in his right ear woke him in the night and spread to his eye, nose, lips, and the inside of his mouth with tingling of his tongue on the right side and in that order. The whole painful region throbbed with each heart beat but the pain diminished to an ache after he vomited. Pain was absent in his trunk and limbs.

Reference of pain to remote parts may, however, precede trigeminal pain as in the following case of occlusion of the left posterior inferior cerebellar artery.

The patient was wakened by a severe cramp-like pain in his left shoulder which spread down his arm. Soon afterwards pain developed in the trigeminal area first on the right and then on the left side and sensations of pins and needles and painful cramp appeared in his right upper limb and spread to his lower limb. The pain in his left upper limb and in the right side of his head and face soon disappeared, except for soreness of his right ear. It also diminished in his left trigeminal area but persisted in and round his left eye, as sensations of soreness and tightness. They were still present six months after the onset as well as sensations of aching and of painful cold in his right lower limb, particularly in the thigh, *which were aggravated by worry*. There were cutaneous analgesia and thermo-anæsthesia in the left trigeminal area, especially in the cheek, and in the right side of his body below the neck. Nevertheless, if the left side of his face were touched pain darted to his left eye. With his right hand warm water felt neutral, but cold water evoked a sensation of burning. Also pressure on his right lower limb increased the aching pain that was always present. Sensibility in the right side of his face and left side of his body appeared to be unimpaired.

This case presents points of considerable interest. First, pain began in the upper limb on the side of the lesion, for which the best explanation would seem to be involvement of spinothalamic fibres which were homolateral and uncrossed. Secondly, trigeminal pain first developed on the side opposite to the lesion and persisted as soreness in the right ear. Presumably the crossed quintothalamic fibres from the opposite nucleus were affected before the homolateral nucleus. Thirdly, the occurrence of hyperpathia in the left side of his face and in his right lower limb; and fourthly, the continuous pain in the right lower limb was aggravated by worry as is common in the thalamic syndrome.

Syringobulbia is occasionally associated with trigeminal pain, and Foix, Thévenard, and Nicolesco [19] have recorded a case of severe bilateral pain in the face in which, at autopsy, a small cavity was found in one descending root of the fifth and gliosis in the other.

Central pain from lesions of the pons has been discussed, amongst other writers, by Weisenburg and Stack.[64] It is a rare complication and whilst it has followed vascular lesions it appears to be most often due to tumours, especially tuberculomas. As an example, von Economo's case [62] may be briefly quoted.

A man of 35 complained of severe pain in his trunk and limbs on the right side, which kept him awake and for which morphia had to be given. On examination there was loss of sensation to pain and temperature in his right upper limb and half of his trunk and to heat in his right trigeminal area. Tactile and deep sensibility were unimpaired. The left motor and sensory fifth and the seventh were involved. Slight nystagmus, chiefly to the right, was present. Taste on the left side was unaffected. There was no paralysis of the limbs but the reflexes were perhaps brisker on the left than on the right side. At autopsy a tuberculous lesion was found, the largest part being in the pons at the level of the fifth sensory nucleus. It stretched from the upper part of the pons to the entrance of the left acoustic nerve. The left eighth nerve and the greater part of the vestibular tract of Deiter's nucleus were destroyed. The motor and sensory nuclei of the left fifth were damaged as well as the spinotectal and spinothalamic tracts and most of the lateral tegmental reticular substance. The median lemniscus had escaped.

The following cases, for which I am indebted to my colleague, J. Purdon Martin, are of considerable interest. In the first, the lesion was almost certainly due to a tumour, probably extramedullary. The salient features only will be given.

A woman of 54 was admitted to the National Hospital with a fourteen years' history of symptoms pointing to a right auditory nerve neurofibroma. Over a year before admission, and at a time when there was evidence of increasing involvement of the brain-stem, she began to complain of pain in the whole of the left side of her body from her head to her toes. She felt as if it were scalded and the burning sensation was aggravated by a hot bath. Her fingers were so painful that her nails could not be cut. But, in addition, every sensation in her left side had been unpleasant during the six months before her admission to hospital. On examination sensibility to pain was abolished on the right side in the distribution of the first and second divisions of the fifth and diminished in that of the third. On the other hand, over the whole of the left side from the face downwards, although sensibility of prick, heat, and cold was very defective, stimulation aroused sensations of an extremely disagreeable kind. All other forms of sensibility were intact on both sides of her body, except in the right trigeminal area. Because of the patient's critical condition operation was not advised. In this case, as in the last, pain and hyperpathia were associated with loss to pain, heat, and cold, all other forms of sensation being unaffected.

The chief points of interest in the second case are the restricted area of pain and hyperpathia and the absence of sensory loss.

A man of 59 was proved at autopsy to have suffered from telangiectasis of his brain-stem. During the course of his illness he complained of an aching pain which began in the little and middle fingers of his right hand and spread to the ulnar aspect of his right forearm. It was continuous, was apt to keep him awake, and was aggravated by various forms of stimulation, including movement of the affected parts. Careful examination, however, failed to reveal any sensory loss in his right upper limb.

GENERAL FEATURES OF PONTOBULBAR PAIN

The time of onset of pain, in relation to that of other symptoms, may be early or late. It can best be judged with vascular lesions and, in such cases, may coincide with the stroke, as is most usual, or may first appear several days or more after it.

Whether "spontaneous" or evoked by direct stimulation it has, in general, the same characters as pain of thalamic origin. It is perhaps less severe and is less associated with mental distress, but the difference is one of degree. The extent of irradiation of evoked pain again appears to depend, in part at least, upon whether or not the sense of localisation is affected. As in the case of the thalamus, pain and hyperpathia with pontobulbar lesions may be evoked by massive stimulation when sensory loss is gross and painful sensations are frequently compound, thermal

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qualities, especially of burning, being common. As is often the case with hyperpathia from lesions at any of the appropriate levels of the central nervous system, any form of adequate stimulation may evoke a sensation of abnormal quality quite apart from the associated discomfort. These perverted sensations are common enough and are frequently described as thermal. Thus a sensation of disagreeable or painful burning may be excited by touch or pinprick.[41] Sometimes even gentle stimulation is unbearable, as in Spiller's case [54] in which a fly walking on the face caused very painful reactions.

Pain, although varying in severity, is usually continuous and subject to exacerbations either for no apparent cause or from objective stimulation of the affected parts. It may also, as in thalamic cases, be aggravated by emotional disturbance [54] (personal case, p. 1097), a sudden loud noise,[20 54] or strong visual stimulation,[20] but special sense impressions may, as in the thalamic syndrome, act, in part, through the emotions they excite.

The distribution of the pain is most often crossed, the face being affected on the side of the lesion and the trunk and limbs on the opposite side, because of the frequency with which the bulbar pain syndrome is the result of unilateral thrombosis of the posterior, inferior cerebellar artery. Occasionally in such cases trigeminal pain is bilateral, developing on the two sides either simultaneously [24 65] or successively [63] (personal case, p. 1097), and it is then due to involvement of both the descending root of the fifth and the quintothalamic fibres from the opposite nucleus which have crossed to the side of the lesion. Still more rarely, pain is confined to the opposite half of the face. As has already been mentioned, the pain is usually referred to the territory of the first and second divisions, but the third may not escape and then the tongue, gums, and inner side of the cheek may be involved.

With pontine lesions, pain in the face is most often on the side opposite to the lesion, as is, of course, the pain in the limbs and trunk.

Trigeminal pain is more common than remote pain and is usually more severe and persistent, but there are exceptions to this rule, for pain in the trunk and limbs on one side may form the chief complaint. It may be limited to part of the affected side, for example to the lower limb [41] (personal case, p. 1097) or to the forearm and hand (Martin's case, p. 1097). In a case of Foerster's,[20] micturition caused intolerable burning in the urethra on the affected side.

Some sensory loss to pain, to heat, and to cold is present, but not necessarily in equal degree, for the same dissociations may be found as with lesions at thalamic and spinal levels. Pain and hyperpathia may be present, as in some thalamic cases, even when analgesia and thermo-anæsthesia is apparently complete. Other forms of sensation may or may not be diminished.

Pontobulbar pains, whether facial or remote, are often but not invariably chronic. When severe, like most pains of central origin, they are comparatively resistant to analgesia remedies.

I have purposely excluded from consideration tic douloureux as a rare symptom of disseminated sclerosis because, in spite of some evidence to the contrary, its origin is almost certainly never mainly central. Clinically tic douloureux is a distinct syndrome clearly distinguishable from the trigeminal pains we have been considering.

(*To be continued*)

HISTOLOGY OF DIABETES INDUCED IN DOGS BY INJECTION OF ANTERIOR-PITUITARY EXTRACTS

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(WITH ILLUSTRATIVE PLATE)

The work of Houssay and others has shown that the daily injection of suitable anterior-pituitary extracts into intact animals may induce the temporary appearance of the symptoms of diabetes mellitus. Young (1937) has further shown that if a large dose of a suitable extract is administered daily to dogs, the diabetic condition may continue after the daily injections cease, and apparently becomes permanent. Of 6 dogs treated with suitable extracts, only 1 failed to become permanently diabetic (Young 1938a). The permanent diabetes resulting from the injection of anterior-pituitary extracts differs from that following removal of the pancreas in that the pituitary animals are able to survive, apparently indefinitely, without insulin therapy, whereas depancreatised dogs will live without insulin for only a few weeks at the most.

In the present paper are recorded the results of the histological examination of the islets of Langerhans of 5 dogs which had received daily injections of a diabetogenic crude extract of ox anterior-pituitary gland. Pancreatic tissue was obtained from 2 of these dogs (Nos. 15 and 16) during the period of daily pituitary injections. Dog 15 was anæsthetised and the pancreas removed aseptically at a time when this animal had become resistant to the diabetogenic action of the injected extract; Dog 16 was killed when exhibiting a diabetic condition which was presumably only temporary. Tissues from two dogs which became permanently diabetic as the result of pituitary injections (Nos. 28 and 40) were also examined; their early history has already been given (Young 1937). Pancreatic tissue was obtained from the one dog which failed to become permanently diabetic as the result of suitable treatment (No. 41), one month after the last pituitary injection had been given. The early history of this dog has also been described already.

As organs of some of these dogs other than the pancreas were also examined a description of the results so obtained will be given.

METHODS

Zenker-formol (Helly), or a modification of this fluid described by Bailey (1937), were found to be the most suitable fixatives for the pancreas. With the exception of Dog 40, pieces of tissue were taken from the head, body, and tail of the pancreas in each case, the remainder of the organ being fixed in 10 per cent. formalin. A stain differentiating the alpha and beta cells of the islets of Langerhans, in a manner suitable for photomicrography, was devised by combining Heidenhain's iron hæmatoxylin with Mallory's phosphotungstic acid hæmatoxylin. Thin sections, cut in celloidin-paraffin, were mordanted in 3 per cent. iron-alum for 24 hours and overstained in Heidenhain's aqueous hæmatoxylin. After differentiation of the hæmatoxylin with iron-alum

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until only a faint nuclear staining remained, the sections were transferred to phosphotungstic acid hæmatoxylin at 50° C. for one hour; then dehydrated and mounted in balsam. The Heidenhain azan modification of Mallory's triple stain was also used on celloidin-paraffin sections from this material (see Thomas, 1937).

The methyl-violet, congo-red, and iodine tests for amyloid were carried out on frozen sections of the material fixed in formalin. The sections of the pituitary gland, fixed in Zenker-formol, were stained by a modification of Mallory's triple stain using Altmann's aniline acid fuchsin and differentiated in saturated aqueous picric acid before staining with the usual aniline blue-orange G solution.

HISTOLOGY OF TISSUES OBTAINED DURING THE PERIOD OF PITUITARY INJECTIONS

DOG 16.—This animal was killed during the period of pituitary injections at a time when the diabetic condition was well established. His history is given in Fig. 4 of Young (1938b).

Pancreas.—Mitotic figures were present in the islets of this pancreas (see Fig III on Plate). In our experience the islet cells of a normal adult dog are rarely if ever seen in mitosis, and these findings in Dog 16 probably indicate an increased rate of proliferation in the islet tissue. In addition there is clear evidence of cellular degeneration in the islets of this pancreas. One or more of the beta cells in each islet were found to be greatly hypertrophied. The vacuolation of the cytoplasm and the varying degrees of pycnosis in the nuclei were typical changes in these cells. In some islets the degenerating cells had left large blank spaces in the islets. The alpha cells in all the islets examined were normal.

Pituitary gland.—The pars intermedia in this gland was apparently very active, the hypophyseal cleft being filled with colloid similar in staining reactions to that in the small vesicles within the pars intermedia itself. Small areas of proliferation occurred on the surface of the pars intermedia bordering the cleft. The chromophobe cells in these regions contained droplets of colloid similar to that in the cleft. The pars anterior and pars nervosa of the gland appeared to be normal.

DOG 15.—This animal received daily injections of pituitary extract for over six weeks. During this period the animal accommodated itself to successive increases in the dose injected daily by becoming resistant to the diabetogenic action of the extract after an initial response. His history is given in Fig. 3 of Young (1938b).

Pancreas.—Again in this pancreas the characteristic hypertrophy and degeneration of individual beta cells was noted. Mitoses were also found in some islets. In the islets of this animal more beta cells had undergone degenerative changes than in the islets of Dog 16 (see Fig. IV).

HISTOLOGY OF TISSUES OBTAINED AFTER INJECTIONS HAD BEEN DISCONTINUED

DOG 28.—The early history of this animal is given in Fig. 1 of Young (1937). He became permanently diabetic after 25 daily injections of crude anterior pituitary extract, and died 44 weeks after the beginning of the experiment. Death followed the cessation of insulin administration after a period of experimental insulin therapy. As has already been stressed (Young 1937), the administration of insulin was apparently not necessary for the continued well-being of this animal in its normal condition.

Pancreas.—In the material examined, which includes sections taken from the head, body, and tail of the pancreas, we have been unable to discover any islets of Langerhans containing normal alpha or beta cells. The islets have been replaced, in a remarkably specific manner, by a hyaline material giving similar staining reactions to those of collagen (see Fig. I). The tests for amyloid in these hyaline areas were negative. The hyaline degeneration was so far advanced in the majority of the islets that not even degenerated cells resembling alpha or beta cells could be distinguished. The boundaries of the atrophied islets were seldom as clearly defined as in a normal pancreas, since the hyaline material often extended between the adjacent acini and covered a greater area than is normally occupied by a single islet. Fragments of degenerated acini were commonly found within the hyalinised areas.

The acinar tissue showed a condition of subacute pancreatitis in all the material we have examined. This confirmed the original macroscopical findings (Young 1937). In some lobules there were small areas of necrosis and hæmorrhage, with inflammation of the interlobular connective tissue. Apart from these localised lesions, the alterations in the acinar tissue appeared to be associated with obstruction of the duct system and with fatty infiltration of the duct epithelium. There was no extensive degeneration of the acinar epithelium and stages of zymogenesis could be detected in most of the sections.

Pituitary gland.—The sinusoids of the anterior lobe were extremely congested but there was no conspicuous degeneration in the glandular tissue which contained normal alpha, beta, and chromophobe cells. In comparison with the other dogs there was an unusual number of vesicles containing colloid in the pars intermedia.

Adrenal glands.—Apart from small areas of lymphocytic infiltration in the cortex, these glands appeared normal.

The *thyroid gland* was of the inactive type, having follicles distended with colloid and lined by a flattened epithelium. The gland was not obviously enlarged.

DOG 40.—This dog, which is still alive, became permanently diabetic at the end of May, 1937, following 16 daily injections of anterior pituitary extract (see Fig. 3 of Young 1937). He excretes about 100 g. of sugar daily on a moderate protein diet. He first received insulin, 50–60 units per day, at the beginning of January, 1938, when the tail of the pancreas was removed for examination at a biopsy operation.

Pancreas.—The islets of Langerhans were intact in this piece of pancreas. Some islets were quite normal but the majority showed cytological changes which were apparent only in the sections stained specifically for the various cell-types. No evidence of extensive degeneration could be detected in the beta cells. In almost all the islets, however, groups of beta cells lacked specific cytoplasmic granules, although the cells were not hypertrophied and their nuclei were normal (see Fig. II). We regard the loss of the specifically staining granules in the cytoplasm of the beta cells as indicative of functional exhaustion. The remainder of the beta cells and the alpha cells in most islets showed sharply staining cytoplasmic granules densely crowded in each cell, as in the normal pancreas. By comparing the reticular fibre pattern in silver impregnated sections of the pancreas from this dog and from Dog 41 (see below), it was evident that a slight degree of fibrosis existed in the islets of Dog 40. The islets were commonly found to be subdivided by the reticular fibres into groups of normal and agranular beta cells. In a few islets hypertrophy of individual beta cells was noted. The latter phenomenon was much less conspicuous than in the cases of Dogs 15 and 16. No abnormality was found in the acinar tissue and its duct systems beyond a slight degree of fatty infiltration of the duct epithelium.

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HISTOLOGY OF TISSUES OBTAINED FROM A DOG WHICH DID NOT BECOME PERMANENTLY DIABETIC AFTER PITUITARY INJECTIONS

Dog 41.—This dog, the only one in six, failed to become permanently diabetic, although a severe temporary diabetic condition was produced. The animal was killed one month after the last injection of extract.

The pancreas, adrenals, thyroid, and pituitary gland of this dog were normal. The islets of Langerhans in this dog appear to provide a normal control for comparison with the islets in the rest of the series. No stages of functional exhaustion, hypertrophy, or degeneration in the beta cells have been found. The reticular fibres, in contrast with the condition described above in Dog 40, were confined to small networks accompanying the capillaries and forming a thin capsule around the periphery of each islet.

DISCUSSION

Richardson and Young (1937) found that the daily injection of a crude anterior-pituitary extract into rats resulted in a substantial hyperplasia of the islet tissue. In the present paper the pancreatic islet tissue of the dogs killed during the period of pituitary injections (Nos. 15 and 16) showed unusual mitotic activity. It seems possible that one response of the dog's pancreas to diabetogenic pituitary extracts is hyperplasia of the islet tissue. A functional proliferation thus induced might account for the ability of the dog to become resistant to the diabetogenic action of a given daily dose of extract (cf. Young 1937, 1938b). As well as mitotic figures, the pancreatic islets of Dogs 15 and 16 contained some hypertrophied and degenerating cells. These are similar to those described by Weichselbaum (1911) in the diabetic human pancreas, and by Allen (1922) as occurring in the pancreatic remnants of his dogs made diabetic by suitable dietary measures following partial pancreatectomy. The onset of diabetes in Allen's animals was accompanied by functional exhaustion of the beta cells in the small amount of islet tissue remaining. Following the loss of cytoplasmic granules, the beta cells hypertrophied and the majority became vacuolated and disappeared after degeneration of the nuclei. The term hydropic degeneration has been used to describe this process.

In a long series of experiments Allen showed that the severity of the diabetes could be correlated with the amount of hydropic degeneration in the beta cells. When the islets in his material contained only a few hypertrophied and vacuolated beta cells, the diabetic symptoms were very slight. The removal of a further fraction of pancreas with a suitable change in diet increased simultaneously the diabetic symptoms and the amount of degeneration in the islets. In these cases of severe experimental diabetes Allen obtained hydropic degeneration in all the beta cells. This extensive degeneration was followed, in most instances, by general atrophy of the islet tissue.

As is well known, hydropic degeneration has been found only very rarely in human diabetes. In Allen's opinion (loc. cit.) this is due either to its being missed in mild cases or to the probability that post-mortem changes make it difficult to identify. We believe the present experiments have an important bearing on this problem. In Dog 40, permanent diabetes is associated with hydropic degeneration in only very few individual beta cells of the islets we have examined. This type of degeneration cannot be regarded as a prominent lesion in the pancreas of this permanently diabetic dog. The fact that the material was taken at biopsy excludes the possibility that these findings were influenced by post-mortem changes. This therefore seems to constitute a clear-cut case of experimental diabetes, in which there appeared to be no extensive hydropic degeneration in the islet tissue. Warren (1930) states that in his experience hydropic degeneration in human diabetes is very rare, but may occasionally be found in fulminating cases of relatively short duration. It seems likely that hydropic degeneration occurs as the result of a rapidly developed and excessive strain on the islet cells. The removal of a large fraction of the pancreas combined with dietary measures, or the injection of a diabetogenic anterior-pituitary extract (cf. Dogs 15 and 16) may provide such a strain. The strain imposed on the islet cells need not be associated only with a diabetic condition.

DESCRIPTIONS OF ILLUSTRATIONS ON PLATE

MR. RICHARDSON AND DR. YOUNG

FIG. I, Dog 28.—(A) Portion of a lobule of the pancreas (× 40) showing hyaline replacement of the islets of Langerhans (H). (B) A hyalinised islet (H) in which only fragments of acinar and duct epithelium can be identified. The islet tissue has atrophied completely. (× 240.)

FIG. II, Dog 40.—Normal alpha (A) and beta (B) cells, surrounded by beta cells (X) which are devoid of cytoplasmic granules and presumably in a state of functional exhaustion. This is typical of the majority of the islets of Langerhans in the piece of pancreas taken at biopsy. N.B.—To give sufficient contrast between the granular and agranular beta cells for reproduction, the photomicrograph has been taken from an over-stained preparation. (× 680.)

FIG. III, Dog 16.—Showing an unusual number of mitoses (M) in two islets of Langerhans. X=degenerating, hypertrophied islet cells. The section was not stained specifically to show the cell types. (× 470.)

FIG. IV, Dog 15.—Hydropic degeneration in individual islet cells (X). The section is not stained to show the cell types. (× 370.)

We have found that a sublethal dose of colchicine given to normal rats causes, within eight hours, excessive hypertrophy and vacuolation of the dividing pancreatic islet cells without affecting the blood-sugar level. The hypertrophy and vacuolation stages in hydropic degeneration cannot be regarded, therefore, as specific changes associated with diabetes alone.

It has been claimed, particularly by Warren (1930), that many cases of human diabetes show no cytological changes at all in the islets of Langerhans. The islets appear to be normal even in respect of the granule content of the beta cells. In Dog 40 there are a few normal islets but the majority so far examined show stages of functional exhaustion of the beta cells. Many of the beta cells lack cytoplasmic granules, although otherwise they appear to be healthy cells. They have normal nuclei and show no signs of degenerative changes in the cytoplasm. It should be emphasised that all the islets of Dog 40 would have appeared normal if special fixation and staining had not been used to demonstrate the presence or absence of beta cell granules. We have not found all the beta cells to be normal in any dog in the present series except No. 41, which failed to become permanently diabetic following treatment effective in 5 other dogs, and which was killed one month after the last injection. During this period traces of

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MR. RICHARDSON AND DR. YOUNG: HISTOLOGY OF DIABETES INDUCED IN DOGS BY INJECTION OF ANTERIOR-PITUITARY EXTRACTS

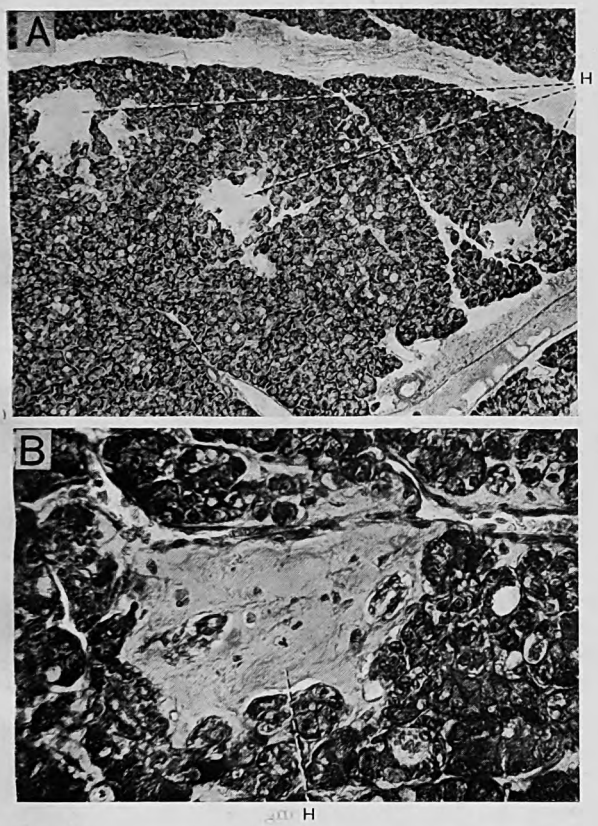

Fig. I

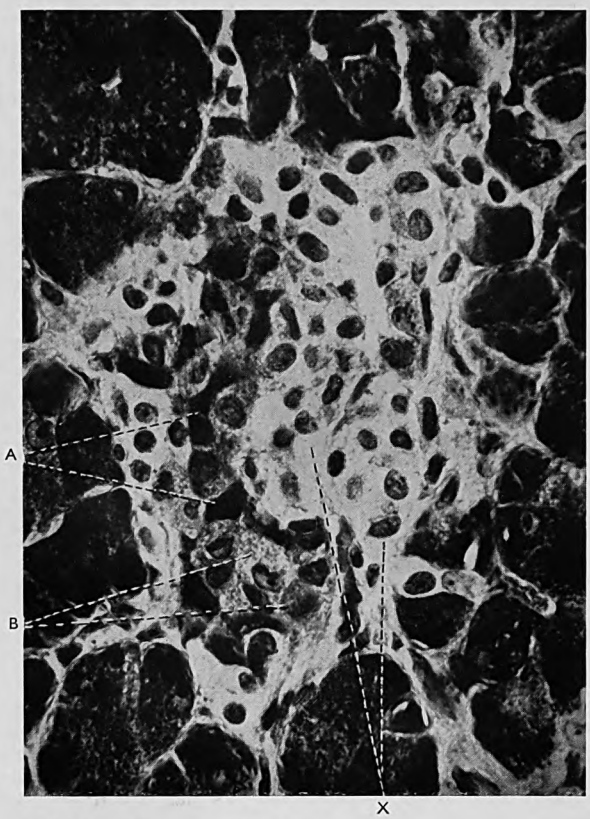

Fig. II

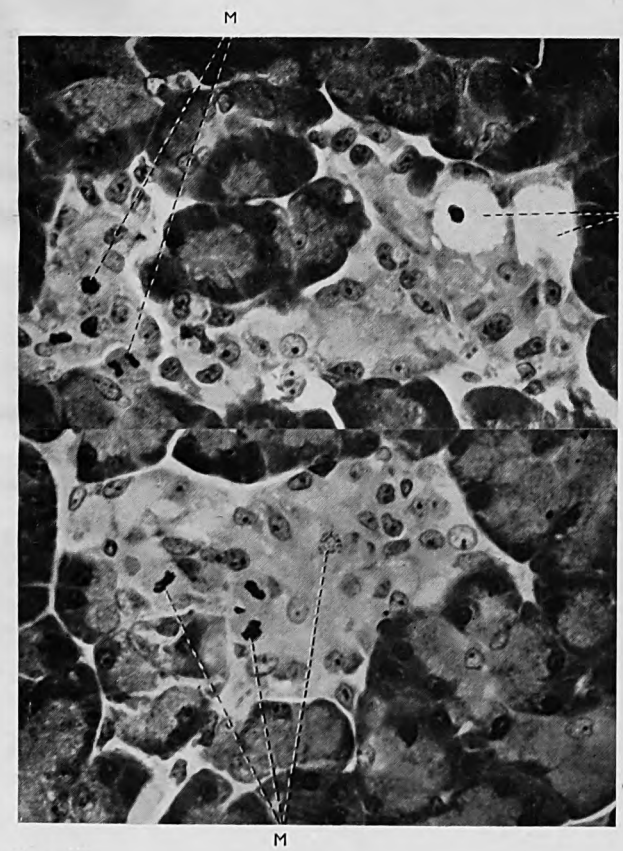

Fig. III

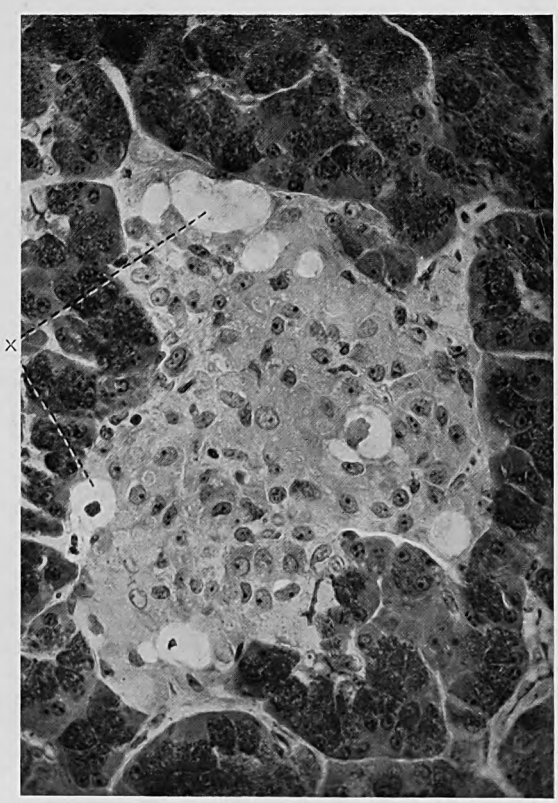

Fig. IV

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MR. KENDALL AND DR. THOMSON: GLOMUS TUMOURS

Fig. I

Fig. II

Fig. III

Fig. IV

DR. ELLIOTT: SUBCUTANEOUS EMPHYSEMA AND PNEUMOTHORAX IN ASTHMA

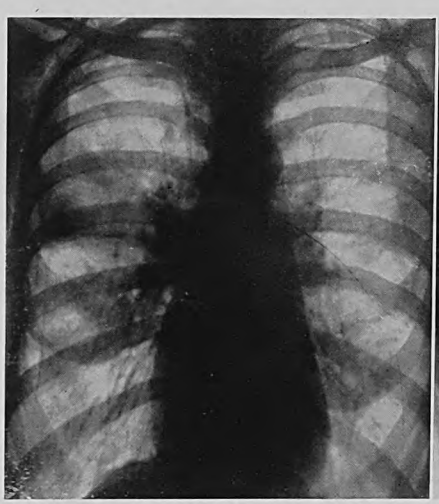

Fig. I

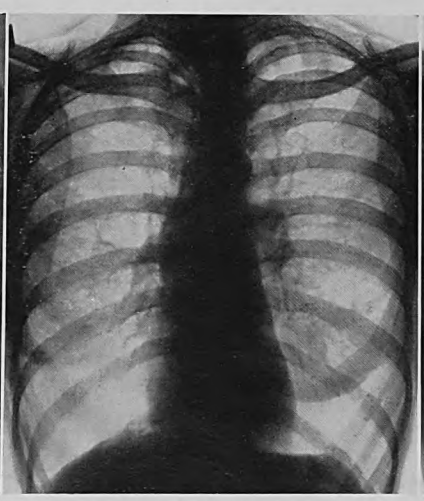

Fig. II

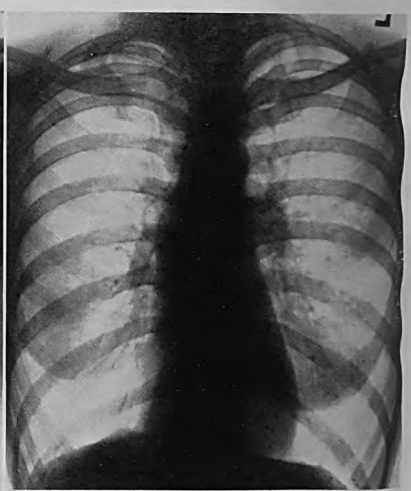

Fig. III

DR. BRAILSFORD: MYELOCELE OF THE UNBORN FŒTUS

Fig. I

Fig. II

Fig. III

Fig. IV

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cellular exhaustion or degeneration, occurring during the course of the injections, may have disappeared. From the limited material at our disposal we cannot decide whether or not experimental diabetes, produced by pituitary extracts, is always accompanied by cytological changes in the beta cells of the pancreatic islets, and in this respect differs from human diabetes.

There is no evidence as to the time of onset of the hyalinisation of the islets in Dog 28. Hyalinisation is, of course, a common lesion in human diabetes. It seems likely that extra strain on islets already in a state of functional exhaustion—e.g., those of Dog 40—might be sufficient to cause extensive hyalinisation of the islet cells. The abrupt withdrawal of insulin may have contributed extra strain on the islets of Dog 28, but it is very unlikely that

DESCRIPTIONS OF ILLUSTRATIONS ON PLATE

MR. KENDALL AND DR. THOMSON

FIG. I.—Subungual glomus tumour in Case 2.

FIG. II (same case).—Section of the tumour (low power).

FIG. III.—Subungual tumour in Case 3.

FIG. IV (same case).—Section of the tumour (low power).

DR. ELLIOTT

FIG. I (Dec. 31st, 1937).—Small pneumothorax on right side. Extensive subcutaneous emphysema. The position of the chest consistent with that seen in asthma. No other underlying lung lesion shown.

FIG. II (Jan. 14th, 1938).—Pneumothorax smaller. Still a considerable degree of surgical emphysema.

FIG. III (March 25th, 1938).—No evidence of disease of the chest.

DR. BRAILSFORD

FIG. I.—Antero-posterior view of spine of mature normal fœtus.

FIG. II.—Antero-posterior view of fœtal spine with myelocele.

FIG. III (same case).—Lateral view showing characteristic hump of myelocele in lumbar region.

FIG. IV.—Fœtus radiographed in utero, showing myelocele of lumbar spine.

complete hyaline replacement could have occurred in the five days before the animal died.

The question now arises: are the islet changes sufficient in themselves to account for the diabetic condition of Dogs 28 and 40? In the case of Dog 28 there is no difficulty whatever in considering the islet lesions efttirely sufficient to account for the condition of the animal. It is nevertheless very surprising to find that this animal lacked any recognisable islet tissue, yet differed so markedly from a depancreatised dog. At present there is no direct evidence that a secretion of the acinar pancreatic tissue plays a part in carbohydrate metabolism, but this possibility may have to be considered. The changes in the islets of Dog 40 were admittedly slight and not easily recognised, and this animal's pancreas contained apparently normal islet tissue. It is by no means obvious that such changes as were present were sufficient in themselves to account for the severe and persistent diabetes. On the other hand, it has already been mentioned that human diabetes is often associated with a similar lack of any profound or obvious change in the histological appearance of the islet tissue. It is perhaps of some significance that the diabetic condition of Dog 40 is apparently slightly less severe than that of the three other similar dogs so far examined. Marks and Young (1938) determined the relative amounts of sugar and nitrogen excreted when these permanently diabetic dogs received a non-carbohydrate diet. Although the D/N ratios were not far from 3/1, the value for Dog 40 was occasionally below this figure while the ratio for the other dogs was usually around 3·5/1. Moreover, although the other dogs often quantitatively excreted 50 g. of glucose added to a protein diet, Dog 40 usually excreted slightly less than the amount ingested. It must be stressed, however, that over a period of ten months Dog 40 has not shown any sign of progressive recovery from the diabetic condition, and his state was not improved after a period of insulin therapy, during which his islet cells were presumably rested.

With regard to the other endocrine glands examined (Dogs 16 and 28), we have been unable to discover any marked pathological changes which might be associated with the experimental diabetes. At present we have an insufficient number of pituitary glands from these diabetic dogs to decide whether significant changes have occurred in the glandular cells of the pars anterior and pars intermedia.

SUMMARY

1. The pancreatic islets of two dogs, killed during a period of daily injections of a diabetogenic anterior pituitary extract, showed cellular proliferation and hydropic degeneration in individual islet cells.

2. The pancreas of a dog, which had been diabetic for ten months after cessation of pituitary injections, and which probably died in diabetic coma, contained no detectable normal islet tissue. The islets were completely hyalinised. Pancreatic tissue was obtained from a second dog, which had been diabetic for nearly ten months after cessation of injections, by biopsy operation during a period of insulin therapy. There were some normal islets, but the majority showed varying grades of depletion of cytoplasmic granules in the beta cells. Only very few of the islet cells of this dog exhibited hydropic degeneration.

3. One dog, the only one in six which failed to become permanently diabetic following treatment with suitable anterior pituitary extracts, had, one month after the cessation of pituitary injections, islets of Langerhans which appeared to be normal in every respect.

4. It seems possible that there are three types of response of the islet cells to the injections of anterior pituitary extract: (*a*) proliferation, (*b*) hydropic degeneration of some beta cells, (*c*) disappearance of the granules in the cytoplasm of other beta cells. Hyalinisation may finally occur. Hydropic degeneration was not a prominent feature of the islets of the two permanently diabetic dogs.

5. Proliferation of the islet cells, which was also observed in the pancreas of the rat (Richardson and Young 1937) may precede, in the dog, the exhaustive or degenerative changes which accompany the onset of permanent diabetes.

6. The other endocrine organs of those dogs in which they were examined showed no striking histological changes.

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GLOMUS TUMOURS

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(WITH ILLUSTRATIONS ON PLATE)

Although the existence of glomus tumours has been recognised clinically for many years, their pathogenesis has been determined only comparatively recently. It is now known that they have their origins in certain normal minute organs, the "neuro-myo-arterial glomera" of Masson. Overgrowth of the constituent parts of such a glomus results in the formation of a small tumour, with certain characteristic histological and clinical features. In the past some of these tumours have undoubtedly been mistaken for angiosarcomata or peritheliomata, whilst others have obtained scanty recognition as "painful subcutaneous tubercles."

Though glomus tumours are rare many of them certainly escape recognition and record. In the eleven years following Masson's description of the glomus in 1924 only about 65 cases were reported (Bailey 1935). But the 3 cases now to be described were seen by us within two years at one hospital, which suggests that the rarity of the condition has been over-estimated—unless the "rule of threes" be invoked.

THE GLOMUS

The work of Grant (1930) in this country has supported and amplified that of Masson, enabling us to appreciate the existence of these complex bodies. A brief summary of their main features may perhaps be permitted, as they are still but little known. The diameter of the normal glomus may be as little as 60 μ or as much as 200 μ. It is a microscopic arteriovenous anastomosis provided with a special nervous mechanism and is surrounded by loose connective tissue. Each structure is composed of an afferent artery, the anastomosis, collecting veins, and coarse lamellated connective tissue which acts as a surrounding envelope. The essential part is, of course, the anastomosis, an arteriovenous channel which is usually both coiled and twisted. This vessel is extraordinary in that the elastica interna is absent; its lumen is narrow but is yet capable of considerable dilatation, its wall is thick and contains special "glomus-cells," and finally it is surrounded by a thick network of nerve-fibres. The glomus-cells are actually unstriped muscle-fibres so modified that they appear on section as large round or oval cells with chromatin-poor nuclei and a fair amount of cytoplasm. Numerous intercellular processes connect them together.

These curious organs are found in the deepest parts of the dermis and adjacent subcutaneous tissue, usually aggregated into groups. They occur particularly over the palmar and plantar surfaces of the hands, fingers, feet, and toes, but they are absent from the dorsal surfaces except for the nail-beds, where they are very numerous indeed. It is said that the normal glomus has so far been found only in the hands and feet of human beings, but it is at least certain that glomus tumours have been recorded in other parts of the body. The organs undoubtedly play a great part in the regulation of the skin temperature in those areas where they are present. Masson suggests that they also assist in the maintenance of interstitial pressure, which must facilitate the functions of the tactile corpuscles.

THE TUMOUR

Each tumour is seen as a well-defined round or ovoid growth situated at the junction of the dermis and subcutaneous tissue and projecting into both. The lamellar capsule encloses a mass of cells in which numerous spaces are seen. These spaces are largest at the periphery, being converted into smaller fissure-like channels in the centre. Under higher magnification it can be seen that a single layer of flattened epithelial cells lines most of the spaces, and that these are themselves vascular, for the larger peripheral lumens contain blood. The majority of the cells in the tumour are the glomus-cells to which reference has already been made and which really form a syncytium of the special unstriped muscle cells of the vessel walls.

Each tumour has a definite hilum and here the afferent and efferent vessels are enclosed in connective tissue. The former vessel changes its characteristics abruptly on entering the capsule; it becomes narrow and its wall becomes thicker, being now composed of increased unstriped muscle-fibres which are more and more characteristically glomus-cells the nearer the centre of the tumour is approached. Elastic tissue is present in the periphery but has disappeared in the centre. Myelinated nerve-fibres are seen at the hilum but only unmyelinated fibres can be found within the capsule.

In brief, the glomus tumour resembles the normal glomus in structure—it is merely an overgrowth of a normal organ. Masson distinguishes three subvarieties each distinguishable by the dominance of a particular feature. His nomenclature is self-explanatory: angiomatous, paucivascular, and lastly, neuromatous. In the paucivascular form there are more likely to be some degenerative changes and indeed columns of glomus-cells showing mucoid degeneration (stained by Athenian blue) are seen in our first case (Fig. V in text), which corresponds to Masson's paucivascular variety. In our third case the tumour is more vascular and may be classified as a representative of the angiomatous type (Fig. IV on Plate). There is no point in describing the histology of these cases in detail; all three showed the features essential to these tumours. Parkes Weber and Freudenthal, the authors of a masterly treatise on this subject (1937), have kindly examined the material from our three cases and are in complete agreement with the diagnosis in each instance. This agreement is particularly important in the first case, an example of heterotopic growth, in that the tumour appeared in a site in which normal glomera have not yet been detected.

CLINICAL FEATURES

Glomus tumours are commonest in middle age but they have been described both in young and old. In about half the recorded cases there is a history of previous trauma, a history which may sometimes be doubtful, though often, as in our first case, it seems to be irrefutable. The tumours themselves are small and purplish, the deeper examples resembling a fresh bruise whilst the more superficial lesions are somewhat redder and appear to be more frankly hæmangiomatous. They are most frequently seen in the nail-beds of the fingers but a few have been found on the trunk. By no means all of these heterotopic growths can, however, be accepted as true glomus tumours.

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The dominant symptom is pain and this has usually been present for a number of years before the patient seeks relief. This painful period has averaged fourteen years in the cases which have been described previously and has ranged from five to twelve years in our series of 3. Pain may first be noticed a few months after the appearance of the discoloured tumour or its development may be delayed; but in any case it is usually only slight at first. Sooner or later however it becomes remarkably severe, with characteristic paroxysms. When the patient presents himself for treatment it is sometimes found that severe pain has been present for considerable periods. The delay in seeking relief is almost certainly to be explained by the paroxysmal and

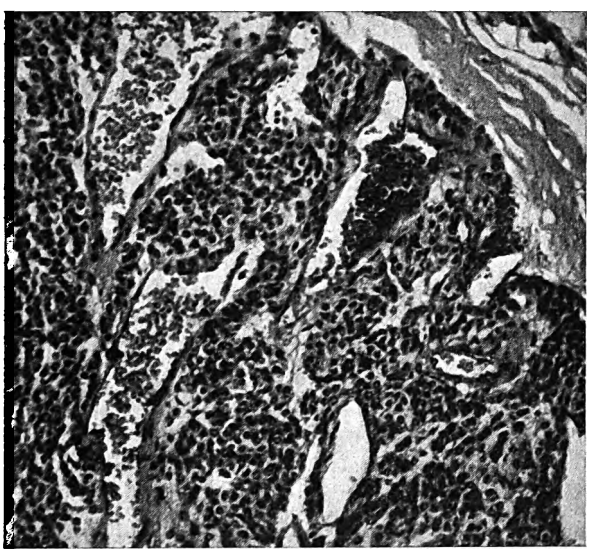

FIG. V.—Section of tumour from Case 1 showing mucoid degeneration.

inconstant nature of the pain; it provides an excellent example of the rapidity with which past discomforts are minimised and partially forgotten. The attacks are always excited by trauma, though a touch may suffice, or even a change in temperature (Case 2). The pain is most frequently burning or stabbing, and tends to radiate proximally along the affected limb. In none of our 3 cases did it wake the patient at night; it may be remarked that the patients were all normal and otherwise healthy subjects showing no signs of a neurotic tendency.

When the tumour is subungual (its most frequent site) the discoloration under the nail is usually noticed early on, being then dismissed as a painful bruise. Later the nail becomes deformed either by ridging or central elevation or sometimes by partial splitting of the nail-plate. In many such cases there will almost certainly be a history of previous avulsion of the nail without relief. By the time such a patient seeks advice he will have perfected his own protective mechanism of avoiding slight friction and knocks, and it will be found that all examination in the form of palpation is firmly discouraged.

CASE-HISTORIES

Case 1.—A bus-driver, aged 38, attended the out-patient department of King's College Hospital complaining of a painful lump just above his left knee. Ten years previously, whilst getting off his bus, he knocked this part of his knee and a small painless lump appeared after a few days and lasted about a week. About five years later he noticed at the same situation a small nodule which caused some discomfort for a few days and then again vanished. Ten days before coming to hospital he began to have a severe stabbing pain in the knee and once again noticed the small swelling which was now larger. The pain became much worse, recurring spontaneously at about two-hourly intervals during the day and returning if the part received the slightest knock. It radiated up and down the leg but was absent at night. Examination revealed a small bluish-red swelling about an inch in diameter over the upper and outer part of the left patella. Satisfactory palpation was not permitted but it was obvious that the nodule was attached to the skin and moved freely with it. The tumour was excised together with an elliptical area of skin. It was then obvious that the pink growth was adherent to the skin and was encapsulated. Subsequent measurements proved its longest diameters to be 8×9 mm. The patient was seen more than two years later and there had then been no recurrence of either tumour or symptoms.

Case 2.—A woman, aged 42, attended the out-patient department complaining of pain under the thumb-nail of the right hand. The pain had been present intermittently for twelve years but at first was not very severe. When it began the patient noticed that there was a bluish-red spot under the nail. About three years later the nail began to show a raised central ridge and ultimately split in this situation, and had been deformed ever since. The pain was worse in cold weather and with the slightest knock became extremely severe and lancinating. It radiated up the arm and even involved the right side of the face. There was no history of any definite antecedent trauma. On examination the nail was seen to be centrally ridged and split, with a reddish discoloration deep to the crescent (Fig. I). Very slight pressure on the nail caused excruciating pain. The central portion of the nail was removed and a small pinkish tumour, 4 mm. in diameter, underlying its basal portion was easily found and excised (Fig. II). The patient has been entirely free from symptoms since the operation.

Case 3.—A woman, aged 51, attended the hospital because of pain under the thumb-nail of the right hand. This had been present for five years and was mainly of an aching character except when touched or knocked, when it became very severe and radiated upwards. The nail had twice been removed within the previous twelve months (elsewhere). Temporary relief was obtained on each occasion but lasted only until the nail had regrown, when the pain returned with its old severity. There was no history of trauma. Inspection showed a deformed nail (Fig. III) having a central raised ridge with some slight hollowing on either side. At the base of the nail the centre of the nail-bed showed a pink discoloration about 2 mm. in diameter. The slightest touch to the nail excited the most intense pain. The nail was avulsed and a small rounded tumour, 4·5×3·5 mm. in diameter and yellowish-pink in colour, was removed from the deeper part of the nail-bed at the level of the base of the nail (Fig. IV). The nail has now completely regrown and there has been complete freedom from symptoms since the day of operation. It is interesting to note that the thumb-nail of the left hand now shows central ridging, but there are so far no signs or symptoms of an underlying glomus tumour.

SUMMARY

Glomus tumours are formed by the overgrowth of minute arteriovenous anastomoses normally found in the skin and subcutaneous tissues particularly of the hands and feet. They are most common under the

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finger-nails and may give rise to severe paroxysmal pain over a period of many years.

Three cases are here recorded in which such tumours were excised, with relief of symptoms.

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SUBCUTANEOUS EMPHYSEMA AND PNEUMOTHORAX IN BRONCHIAL ASTHMA

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(WITH ILLUSTRATIONS ON PLATE)

One might expect that in chronic asthmatics the combination of violent respiratory efforts with an emphysematous condition of the lungs would often lead to subcutaneous emphysema or a pneumothorax; but apparently it does not do so. As a complication of asthma, pneumothorax is, I believe, the less uncommon of these two accidents; but I have been able to find reports of only four cases of subcutaneous emphysema and none with a pneumothorax as well. The association must then be exceedingly rare.

CASES OF SUBCUTANEOUS EMPHYSEMA REPORTED ELSEWHERE

1. *Calverley 1902.*—A male athlete aged 17 who had had asthma for 11 years. He had an ordinary attack associated with a fit of coughing. He rested for a day and towards evening felt a pain in the chest and noticed a swelling in the neck which became larger during the night. The lower part of his neck on both sides was swollen and puffy. Respiratory sounds were easily heard in the neck, together with the typical cracklings of subcutaneous emphysema. No pneumothorax or any lesion in the lungs. No emphysema over sternum or ribs. Cardiac dullness absent. Pulse almost imperceptible during inspiration, stronger and slower during expiration.

2. *Whitby 1905.*—A man aged 25 in good general health who had had asthmatic attacks since boyhood. On the day following an ordinary attack he noticed swelling of the front and sides of his neck and this gradually extended to his face and forehead, arms, and wrists, and finally to his thorax and back as far as the sacrum. Palpation revealed the crackling of subcutaneous emphysema. Sputum was purulent and contained pyococci but no tubercle bacilli. His dyspnœa was relieved by morphia and lobelia and the emphysema, which had never been seen in any former attack, disappeared as the attack passed off.

3. *Kahn 1927.*—A girl aged 8 who had had attacks of asthma every 4–6 weeks for 6 years. During a not particularly violent attack swelling due to subcutaneous air infiltration was noticed over the upper part of the chest, back, shoulders, neck, and face, the appearance of the face suggesting parotitis. No pain. Physical signs in the lung were those of an ordinary asthmatic attack. Radiography of the chest revealed the presence of air beneath the fascial layers of the chest and neck, with no other pulmonary lesion and no indication of the site of leakage of the air. No previous similar attacks. Adrenaline injections improved the patient. The air was absorbed in 10 days.

4. *MacDermot 1929.*—A man aged 22 who had had asthmatic attacks for 6 years. During a paroxysm he felt a pain in the upper part of his chest. His neck began to swell immediately afterwards. On admission to hospital he had marked subcutaneous emphysema of the tissues of the neck extending up to the angle of the jaw and down to below the clavicles. Physical examination of the chest gave all the signs of bronchial asthma. Radiography of the chest showed no pathological lesion of the lungs but air was seen in the subcutaneous tissues. No previous attacks. Attack subsided together with the emphysema in 5–6 days. A later attack did not cause a recurrence of subcutaneous emphysema.

REPORT OF PRESENT CASE

A woman aged 46 was admitted to the Royal Infirmary, Sheffield, as an emergency on Dec. 30th, 1937. She had had pneumonia in 1918, since when she had had attacks of asthma at irregular intervals and of irregular duration, chiefly in the winter. The attacks were more troublesome at night and were always associated with cough and copious frothy sputum; no hæmoptysis. During the last three or four years she had become increasingly breathless on exertion, but previous to this had felt in perfect health between the attacks. She had had no treatment for her asthma.

On the night of Dec. 29th, 1937, whilst having her usual nightly wheezing attack, she noticed that the right side of her neck was a little swollen. The swelling gradually became bigger and involved her face and later her arms and chest. There was no pain. The attack lasted throughout the next day, and towards evening she called in her private doctor who sent her into hospital.

She was a small, rather ill-nourished woman. Her breathing typically asthmatic—rapid and wheezy with greatly prolonged expiration. The chest was mainly held in a position of inspiration. She was very distressed. Pulse shallow, 132 per min. Blood pressure 115/80 mm. Hg. Temperature normal. Both sides of the chest moved equally. There was bulging at both apices on coughing. Liver and cardiac dullnesses were both diminished. There was a wide costal angle and the whole of both sides of the chest was hyper-resonant. Expansion of the chest was only half an inch. The breath sounds were very musical over the whole of the chest with profuse râles and rhonchi. As far as could be determined clinically there was no alteration in the position of the heart. The heart sounds were very faint. There were no clinical indications of a pneumothorax.

The right side of the neck was swollen and puffy, as also was the chest, face, and right arm. The swelling gave the typical "egg-shell crackling" sensation to the touch, and crackles could be clearly heard with the stethoscope. There was definite cyanosis.

The patient was given 4 minims of adrenaline (1 in 1000) subcutaneously every three hours, but this did not improve her condition, and in the next three days she became very much worse. The emphysema gradually spread until it involved the whole of the body with the exception of the hands and the legs below the knees. The pulse became shallower and was maintained at 130–140 per min. Cyanosis continued and necessitated continuous intranasal oxygen. The face was greatly swollen, especially in the eyelids, and this rendered vision impossible. She became semi-comatose and could only be roused with difficulty. So serious was her condition that her life was despaired of. A radiographic examination of the chest was made on Dec. 31st (Fig. I on Plate). To our surprise this showed pneumothorax on the right side although there were still no clinical signs of this condition. The lung was not completely collapsed, and the position of the heart was normal.

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Large reservoirs of air were seen in the subfascial planes of the chest wall.

Adrenaline and Coramine injections were given every three hours, and the patient was on continuous oxygen but her condition became worse. We were unable to account for her extreme distress. The pneumothorax was not complete and the normal position of the heart did not suggest that the distress arose from a greatly increased intrathoracic pressure. This was confirmed on Jan. 1st by introducing the needle of an artificial pneumothorax apparatus into the right pleural cavity. The average readings of the manometer oscillations showed a positive pressure of only 4–5 cm. of water. The removal of 350 c.cm. of air soon brought the readings down to a negative pressure of 2–3 cm. of water, but this made no difference to the patient's general condition.

In view of her condition another attempt to remove air from the pleural cavity was made on Jan. 2nd, but a negative pressure of 2–3 cm. of water was found and hence no air was removed. The skin over the breasts was now becoming tense, and to prevent possible gangrene of the skin, two incisions

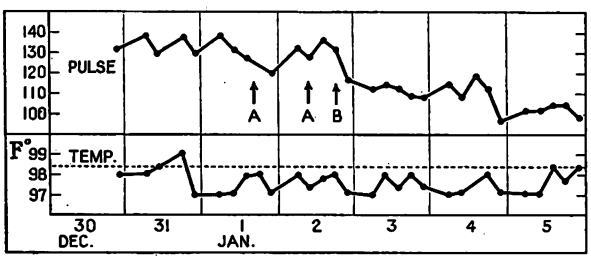

FIG. IV.—Pulse and temperature chart. A=pleural puncture. B=incision of subcutaneous tissues.

each about 2–3 in. long were made above each breast. Nothing of note happened whilst the subcutaneous tissues were being incised, but as soon as the scalpel perforated the deep fascia, air was expelled with alarming force and the tissues collapsed visibly. Within the next 24 hours the patient's condition definitely improved, her pulse slowing to 108 per min., and becoming stronger (Fig. IV). The wounds were left open to allow the escape of as much air as possible, but it is doubtful if any escaped after about two days at the most, as blood-clot and granulations were already forming in the bottom of the wound.

During the next ten days the air in the tissues gradually disappeared, the patient's general condition slowly improved, and her pulse gradually fell to normal. Radiograms taken 9 days afterwards showed that the pneumothorax was very much less in extent (Fig. II on Plate).

An interesting feature of this patient was her eyelids. As her general condition was improving she complained that she was unable to see because of her greatly swollen upper eyelids, which were tense with subcutaneous infiltration of air. Now whilst attempting to take a sample of blood for a routine examination from an arm vein I had had the inglorious experience of removing merely a syringeful of air, owing to the surrounding emphysema. I therefore decided to apply this result to the eyelids and with successful results. About 6 c.cm. of air was removed from each eyelid; they collapsed like a burst balloon, and the patient was able to see immediately afterwards. This is rather surprising because one usually thinks of subcutaneous emphysema as being widely diffused in the tissues rather than being collected in small reservoirs.

The patient was discharged from hospital after being in for a month. She was feeling very well indeed, apart from a little shortness of breath, which could be accounted for by her emphysema. She has been kept under observation ever since as an out-patient. In spite of further nocturnal attacks of asthma, she has had no recurrence of the emphysema or pneumothorax.

COMMENTS

By far the commonest cause of pneumothorax is the rupture of a tuberculous focus into the pleural cavity. Because of chronic cough and sputum this patient was kept under constant observation by the tuberculosis authorities from 1921 until 1933, repeated radiograms of the chest and sputum examinations during this period being all negative for tuberculosis. On three occasions during this period she was taken into hospital for observation, but on each occasion was discharged as being free from tuberculosis. Radiograms during her recent attendance at the Royal Infirmary showed no evidence of disease of the lungs, nor was there any clinical evidence of tuberculosis (Fig. III on Plate).

Although it is always difficult to exclude tuberculosis with certainty, there seems to be no evidence for making such a diagnosis in this patient, and it seems justifiable to conclude that the present case was one of chronic bronchitis with asthma. Several members of her family were also sufferers from bronchial asthma.

In the other reported cases, as in this, subcutaneous emphysema occurred only after attacks of asthma had been present for many years, suggesting some gradual change in the pulmonary tissues which finally gives way under the great strain. On the other hand, one would then expect repeated attacks of emphysema once these had begun, whereas in none of the cases was a second attack reported. The previous cases were all young—8, 17, 25, and 22 years respectively—so that the present patient deviates somewhat in this respect in being 46. It is interesting to note in this connexion that the so-called spontaneous or idiopathic pneumothorax is common in young "healthy" persons. This suggests that rupture of the air cells in these cases is mechanical rather than pathological.

In the present case the pneumothorax does not seem to have been the cause of the patient's distress, since the air in the pleural cavity was not under sufficient pressure, and release of the slight tension did not improve matters. Release of the tension of air in the tissues, however, seemed to produce a definite change for the better. I do not pretend to understand the significance of this, but the fall of the pulse-rate to normal after the incisions were made suggests that back-pressure (possibly on the mediastinum) caused some degree of cardiac embarrassment. In none of the other cases was the patient's general condition bad enough to cause anxiety, and no treatment was necessary apart from that of the primary asthma. Here the patient was desperately ill, and although the above treatment was carried out with no obvious rationale it had the desired results.

TENTATIVE SUGGESTIONS

Boyd (1935) describes a condition of interstitial emphysema of the lung in children caused by over-distension and rupture of the alveoli which may arise from the violent coughing of whooping-cough, the air escaping into the interstitial tissues of the lung. The air collects in the lymphatics in the form of tiny beads, being seen particularly well under the pleura. The air may pass along the lymphatics to the mediastinum, and from there to the root of the neck. If such an occurrence is possible, may we not invoke this pathology in these non-fatal cases of asthma where post-mortem specimens have not been obtainable? In favour of this suggestion we have the fact that in all these cases the emphysema was noticed first just above the clavicles on one or other side, and from this point spread for a varying distance in the tissues, suggesting a rise of air from the mediastinum.

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We have now to attempt to find a common cause for the pneumothorax and the subcutaneous emphysema in this case. Miller, quoted by Boyd, has described a condition, closely related to interstitial emphysema, in which the air escaping from a ruptured alveolus separates the pleura from the underlying lung in much the same way as the escaping blood in a dissecting aneurysm separates the coats of an artery. This causes a small bleb on the surface of the lung. Rupture of this bleb would naturally give rise to a pneumothorax, and at the same time allow the air to enter the interstitial lymphatics and spread thence to the mediastinum and root of the neck. If such was the mechanism in the present case one would not expect the air in the tissues to be under pressure as it seemed to be, unless some valvular mechanism was at work.

When first seen the patient did not show much cardiac embarrassment. The distress gradually developed in about four days during her stay in hospital, suggesting a gradual increase in the tension of the escaping air. This is quite in accordance with the effect of the incisions which released the tension, because although an immediate effect was seen, the pulse-rate and pulse strength took several days to return to within normal limits. Hence whatever mechanism was involved, it was slow in creating an effective disabling pressure.

I am indebted to Dr. R. Platt for his permission to record this case and for his criticism and suggestions.

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RADIOGRAPHIC DETECTION OF MYELOCELE OF THE UNBORN FŒTUS*

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(WITH ILLUSTRATIONS ON PLATE)

Radiography is the most valuable method available to the obstetrician for the diagnosis of deformities of the unborn fœtus. It already permits of the early recognition of gross deformities such as double monsters, anencephaly, hydrocephaly, and severe spinal deformities, and with increasing refinement of technique it should reveal some of the lesser, though important, developmental deformities. My purpose in this paper is to set forth the radiographic characters of one such deformity, the myelocele, which, though incompatible with life, is undetectable by clinical methods.

RADIOGRAPHIC APPEARANCE OF THE NORMAL FŒTAL SPINE

On lateral projection the normal fœtal spine near maturity shows a uniform kyphosis which embraces the cervical, dorsal, and lumbar vertebræ. In the lumbosacral area the general curvature ceases, for the sacrum is flattened out and directed slightly backward. The vertebral bodies show a very gradual increase in size from the cervical to the lower lumbar region and then a diminution to the terminal sacral segments. The dorsal vertebral bodies at this stage often present a bobbin-shaped appearance due to incomplete ossification of their middle third. The bodies of the upper two or three lumbar vertebræ may also show a notch in the middle of their anterior and posterior surfaces whereas those of the lower two are more completely ossified and have a regular contour. The length of the pedicles appears to be equal to the antero-posterior measurement of the bodies, and the articular processes, particularly the inferior, continue the backward projection and increase the antero-posterior dimension of the vertebræ to about twice that of the bodies.

On the antero-posterior projection (Fig. I on Plate) the vertebral bodies show a gradual increase in width and a slighter increase in depth from the upper cervical to the lower lumbar regions, followed by a more rapid diminution in size to the lower sacral level. The bodies, which are oval in shape with often a slight notch in the middle of their superior and inferior surfaces, appear to be pierced by two small holes, one on each side slightly away from the midline—the so-called venous channels. The pedicles and laminæ are projected in the plane of the vertebral bodies and the laminæ almost meet in the midline posteriorly. The articular processes are seen as two rows of opacities which are wider apart in the cervical area, become closer in the dorsal area, gradually separate again to reach their cervical distance at the first sacral vertebra, and then rapidly narrow and become less distinct. The transverse processes appear as small lateral tubercles on the lumbar vertebræ but show greater and more characteristic development in the dorsal area.

RADIOGRAPHIC APPEARANCE OF THE MYELOCELE

On lateral projection the position of the myelocele is indicated by a break in the normal backward curvature and the appearance of a rounded kyphos or hump which includes about six vertebral bodies (Fig. II). The developmental defect produces a bow-like deformity of the spine resembling in shape the bowing associated with projection of the fifth lumbar vertebra which I described as characteristic of spondylolisthesis (Brailsford 1935a and b.) This characteristic bow-like projection, which may be the only indication of the myelocele, depends on the arrest of development of the neural groove. Normally the neural folds meet and fuse, and the neural canal becomes completely encased in bone developed by ossification of the primitive vertebral bow to which the vertebral musculature is attached. In myelocele the neural folds remain apart but their cellular elements undergo progressive differentiation and development which gradually widens the breach in the midline and thus prevents apposition of the articular processes of adjacent vertebræ and allows the deformity to take place. In this kyphotic area the radiographs show little or no development of the laminæ or processes.

On antero-posterior projection (Fig. III) the defect may be recognised by the lateral displacement and direction of the pedicles and processes, which are projected on either side of the adjacent vertebral bodies and not behind as in the normal spine. The total length of the affected spine is diminished, the amount of the diminution depending on the degree and extent of the defects. One or more of the vertebral bodies may exhibit two unfused ossific nuclei. In severe cases defects may be present throughout the entire length of the spine and may be associated with anencephaly or hydrocephalus. In these cases the vertebral bodies do not show the normal uniform progression and the cervical and upper dorsal bodies

* Part of a paper read before the Midland Obstetrical Society in May, 1937.

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may be small while the lumbar appear unduly large and deep in comparison.

The following case (for the clinical details of which I am indebted to Mr. Selby Tait) is one in which the radiographic evidence solely led to early detection of the defective development and indicated the essential treatment.

A primipara aged 23. Amenorrhœa from July 31st, 1936. Admitted to hospital Feb. 24th, 1937. No abnormal antenatal symptoms or signs. Breech presentation was suspected. Radiographs (Fig. IV) showed breech presentation with the characteristic "hump" of a myelocele. Premature labour was induced and the presence of a myelocele confirmed.

Since the reading of this paper the accuracy of this new sign has been verified in several cases.

SUMMARY

Myelocele is a deformity incompatible with life. It can be recognised in the unborn fœtus as a rounded kyphos or hump which includes about six vertebral bodies.

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CUTANEOUS APPLICATION OF FOLLICULAR HORMONE

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As I reported in 1929 the follicular hormone (œstrone) is absorbed through the skin. If we rub a hormone ointment or a hormone oil into the shaven skin of the back of a castrated mouse the animal goes into œstrus, but to obtain this effect we need seven times as much hormone as with subcutaneous injection.

The mammæ show a greater response to percutaneous hormone treatment than the uterus and vagina (Zondek 1935a). If we rub a hormone ointment into the skin of the mammary region of a male guinea-pig, first the treated and then the untreated mamma enlarges, and finally the gland secretes milk. This mammary effect can be induced with the same dose of hormone, either percutaneous or subcutaneous. These results have been verified by Jadassohn, Uehlinger, and Zuercher (1937) who, from the fact that the locally treated mammæ show a quicker and greater enlargement of the nipples than the non-treated ones, conclude that there must be a local hormonal effect. I have given the hormone percutaneously to women, using the Œstroglandol ointment kindly supplied me by Hoffmann-La Roche, and containing 1000 M.U. per gramme (Zondek 1935b). I proposed the application of this ointment in pruritus vulvæ senilis on the assumption that this painful affection could be improved by hyperæmia and softening of the tissues and found it of considerable value. I also used it in the treatment of acne vulgaris in young girls and in women at the menopause, and have been able to benefit the so-called arthritis ovaripriva of the menopause by local treatment of the joints with œstroglandol ointment, a method which deserves further trial (Zondek 1935b).

Animal Experiments

Recent investigations have shown that under certain conditions the percutaneous dose of hormone required to induce œstrus is no greater than the subcutaneous. The decisive factor is the solvent. The more readily the solvent is absorbed through the skin, the better the œstrogenic hormone can exert its effect. If the hormone is dissolved in an oil or ointment only one-seventh is absorbed through the skin; but in an organic solvent such as benzol, ether, or alcohol the whole is absorbed.

EFFECT UPON ŒSTRUS

Three groups of castrated mice received three doses of œstrone totalling 0·1–0·3 μg. (0·0001–0·0003 mg.) in 24 hours.

In *Group A* an oily solution was given subcutaneously. These animals went into œstrus.

In *Group B* a solution in olive oil was rubbed into the shaven skin of the back. These animals did not go into œstrus.

In *Group C* the œstrone was in an organic solvent (benzol or ether or 96 per cent. alcohol) and was rubbed into the shaven skin of the back. Every one of these animals went into œstrus.

EXPERIMENTS ON MALE ANIMALS

As I reported previously (Zondek 1935a) we can produce an antimasculine effect—i.e., impairment of growth of the testes—by percutaneous application of hormone ointment. If a hormone ointment is rubbed into the skin of the back of a male guinea-pig (100 M.U. per diem) for 8 days, the testes decrease in weight by 40 per cent. The antimasculine effect shows itself in the first days of treatment and gradually increases. With 36 days' treatment (a total of 2700 M.U.) the weight of the testes decreases from 3 to 1·3 g.—i.e., by nearly 60 per cent. The effect varies greatly however in different animals.

More recently we have investigated the behaviour of male rats treated for several months with œstrogenic hormone. The animals were divided into three series. The first was treated subcutaneously with the hormone in an oily solution, the second percutaneously with an oily solution, and the third percutaneously with the hormone in an organic solvent (benzol). We used animals aged five weeks weighing 40–50 g. and gave them 500 M.U. of œstrone or œstradiol benzoate twice a week. Two degrees of the antimasculine effect can readily be distinguished: (1) the testes diminish in size, and (2) they retract from the scrotal sac into the abdominal cavity. In all the three series there was atrophy of the testes, but there were differences in the degree of retraction. All the animals treated percutaneously with œstrone or œstradiol benzoate in benzol showed retraction whereas those treated percutaneously with hormone in oily solution showed only atrophy. The animals treated subcutaneously showed an intermediate effect; in most the testes were retracted but in some they remained in the scrotal sac. These results demonstrate the striking fact that the antimasculine effect of œstrogenic hormone given percutaneously in an organic solvent is equal or even superior to that of the hormone given subcutaneously.

I have since observed that also androgenic hormone given percutaneously in an organic solvent is more readily absorbed through the skin than in an oily solvent. I shall report on this elsewhere.

GROWTH IMPAIRMENT

In recent years I have studied the impairment of the anterior pituitary functions by protracted treatment with œstrogenic hormone, the most striking result being the elimination of the growth hormone and the impairment of the growth of the skeleton

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and organs. I have already reported that by percutaneous administration of œstrone we can partially eliminate the anterior lobe (Zondek 1936 and 1937). The shaven skin of the back of male and female rats was painted with two drops of a solution of œstradiol benzoate in benzol three times a week—a total weekly dose of 10,000 M.U. All the animals thus treated were backward in growth. After 11 weeks' treatment their average weight was 89 g. whereas controls weighed 152 g., a difference of 40 per cent.

In our present investigations we have compared the growth impairment when the same amount of hormone is administered (*a*) subcutaneously, (*b*) percutaneously in oily solution, and (*c*) percutaneously in benzol or another organic solvent. In these experiments much smaller doses of hormone were used to ascertain which kind of treatment had the earliest effect. The animals each received 500 M.U. of œstrone twice a week. After 9 months' treatment those treated subcutaneously with the oily solution and those treated percutaneously with the benzol solution showed similar growth impairment, whereas those treated percutaneously with an oily solution showed none. As regards impairment of growth then, the solvent again plays a decisive part.

PITUITARY TUMOURS INDUCED BY ŒSTROGENIC HORMONE

As reported elsewhere (Zondek 1936 and 1937) we can produce large tumours in the pituitary glands of rats by 7 months' administration of œstrogenic hormone, and I have at my disposal 28 such tumours. In those experiments we succeeded three times in producing very large pituitary tumours by percutaneous administration of relatively small doses of œstradiol benzoate dissolved in benzol. The animals had at the same time been rubbed with benzpyrene (2 drops of a 1 per cent. benzol solution three times a week), and this might have increased the effect of the œstradiol benzoate. I therefore arranged a new series of experiments with 12 female rats aged four weeks and weighing about 30 g. The animals each received 500 M.U. of œstradiol benzoate twice a week. Four of them received an oily solution of hormone subcutaneously, four an oily solution percutaneously, and four a solution in benzol percutaneously. After 9 months' treatment I found only one pituitary tumour, and this was in a female treated percutaneously with œstradiol benzoate in benzol. In this experiment, therefore, œstrin given in an organic solvent had more effect upon the pituitary gland than the same amount of hormone dissolved in oil. Moreover the hormone dissolved in benzol and applied to the skin seemed even more effective than the hormone injected subcutaneously in oil.

Clinical Application in Amenorrhœa

To induce true menstruation after oöphorectomy it is necessary to give progesterone as well as œstrone. Unfortunately, though the two hormones closely resemble one another chemically and are both easily soluble in organic solvents, progesterone is not so readily absorbed through the skin as œstrone. This was shown in young rabbits which were given œstrone for eight days followed by progesterone rubbed into the skin of their back for five days. Their uteri showed progestational changes, but these were less than if the hormone had been injected. Since progesterone is still very expensive, injection is to be preferred until a cheaper preparation is available.

The experiments on animals were carried out with œstrogenic hormone dissolved in benzol. In women an alcoholic œstrone tincture (96 per cent. alcohol) proved best. I used the tincture in the following strengths:—

(*a*) Tinctures containing 3 mg. of œstrone—i.e., 30,000 mouse units—in 1 c.cm. Patients were ordered to drop 20 drops (0·5 c.cm.) upon the hairless skin of the forearm or front of the thigh morning and evening for twenty days and to rub with the forefinger until it had completely disappeared. The total dose was 600,000 M.U.

(*b*) Tinctures containing 0·2–0·3 mg. (2000–3000 M.U.) of œstrone or œstradiol benzoate in 1 c.cm. The dose was 5 c.cm. of this tincture (200 drops) rubbed into the skin twice daily for twenty days, a total dose of 400,000 to 600,000 M.U.

(*c*) Tinctures containing 10 mg. (10,000 M.U.) of œstradiol benzoate per 1 c.cm. The tincture was rubbed into the skin 8 to 10 times in twenty days, each dose being 5 c.cm. (50,000 M.U.), and the total dose 400,000 to 500,000 M.U.

After the percutaneous treatment with œstrogenic hormone intramuscular injections of 8–10 rabbit units of progesterone were given daily for five days (total 40–50 units).

I have an impression that the tincture of œstrone is more effective than that of œstradiol benzoate. Rubbing in 5 c.cm. (2000 to 3000 M.U. per c.cm.) of an œstrone solution twice a day appears to be the best method.

CLINICAL RESULTS

Percutaneous treatment with hormone tincture has now been given to 12 patients in 18 menstrual cycles. Bleeding was induced 10 times. It should be emphasised that injections of hormone are not always successful; thus in Case 7 the subcutaneous administration of 400,000 M.U. of œstradiol benzoate and 40 rabbit units of progesterone did not produce menstruation. That we succeeded 10 times by merely rubbing the tincture into the skin appears to me remarkable. In 3 of our 8 failures menstruation was later induced by injections of hormone, so that the percutaneous route seems still to be somewhat inferior to the subcutaneous; but its simplicity makes it very agreeable to the patient, especially where treatment has to be continued permanently.

Primary amenorrhœa.—Since the results in primary amenorrhœa were most instructive I shall describe in detail the two cases treated.

CASE 1.—Aged 28. She has been married for five years and has never menstruated. In March, 1935, when treatment began, her uterus was hypoplastic and only 3 cm. long; her vagina was pale and atrophic like that of an old woman; and the urine contained prolan A (111 M.U. per litre of morning urine), indicating a severe functional disturbance. She received 450,000 M.U. of œstradiol benzoate (Dimenformon) intramuscularly followed by 25 rabbit units of progesterone. Four days after the treatment ended she menstruated for the first time in her life. The uterus then was 6·5 cm. long and its mucous membrane showed the beginning of a progestational stage without glycogen. She was treated several times in this way and regularly reacted by bleeding; but even by increasing the dose of progesterone we could not produce a normal premenstrual mucous membrane. The patient, who came from abroad, interrupted the treatment for two years, during which there was no menstruation. After this interval percutaneous œstrone was tried as follows:—

First course.—From July 28th to August 16th, 1937, she rubbed 20 drops (15,000 M.U.) of alcoholic œstrone tincture into the skin of her forearm and

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SECONDARY AMENORRHŒA: RESULTS IN TEN CASES

Case.	Age.	Duration of amenorrhœa (years).	Uterus (length).	Œstrogenic hormone (M.U. twice daily) percutaneous.	Progesterone (R.U. daily).	Total dose—		Results.
						Œstrogenic hormone (percutaneous), M.U.	Progesterone (parenteral), R.U.	
3	36	3	Retroverted, 6 cm., narrow.	(*a*) 30,000 Œ.	7·5 (4 days). 10·0 (1 day).	600,000 Œ.	40	Bleeding.
				(*b*) 20,000 Œ.	7·5 (4 days). 10·0 (1 day).	400,000 Œ.	40	"
4	43	2½	7 cm.	10,000 Œ.	..	400,000 Œ.	..	"
5	39	1½	Retroverted, 7 cm., narrow.	(*a*) 10,000 Œ.	..	400,000 Œ.	..	No bleeding.
				(*b*) 10,000 Œ.	10·0 (5 days).	400,000 Œ.	50	Bleeding.
6	24	1	Very small, 3–4 cm.	(*a*) 10,000 Œ.	..	400,000 Œ.	..	No bleeding.
				(*b*) 10,000 Œ.	10·0 (5 days).	400,000 Œ.	50	Bleeding.
7	29	1½	Body hypoplastic, 6 cm.	15,000 Œ.	7·5 (4 days). 10·0 (2 days).	600,000 Œ.	50	No bleeding.
8	27	1½	Hypoplasia of third degree.	10,000 Œ.	5·0 (5 days).	400,000 Œ.	25	Bleeding.
9	28	8	4–5 cm., very narrow.	12,500 O.B.	..	500,000 O.B.	..	No bleeding.
10	34	14	6·5 cm., body narrow.	12,500 O.B.	10·0 (5 days).	500,000 O.B.	50	"
11	21	½	4 cm., body size of nut.	12,500 Œ.	..	500,000 Œ.	..	"
12	20	2	Size of finger, hypoplasia of third degree.	12,500 Œ.	10·0 (5 days).	500,000 Œ.	50	Bleeding.

Œ. = œstrone. O.B. = œstradiol benzoate. M.U. = mouse units. R.U. = rabbit units. .. = untreated.

thigh morning and evening, a total of 600,000 M.U. From August 17th to 21st she received 40 rabbit units of progesterone intramuscularly. Four days later fairly copious bleeding started and persisted for three days. Histological examination of a strip of the uterine mucosa showed the mucous membrane in the interval stage.

Second course.—From Sept. 5th to 25th the patient rubbed 5 c.cm. (15,000 M.U.) of an alcoholic œstrone tincture into her skin morning and evening, a total of 600,000 M.U., and from Sept. 25th to 29th she received 8 rabbit units of progesterone intramuscularly daily, a total of 40 units. On the morning of Oct. 3rd bleeding began; six hours later a piece of uterine mucosa showed abundant glands but no typical progestational change.

Third course.—An alcoholic tincture of œstradiol benzoate was now given in place of œstrone. From Oct. 8th to 28th 5 c.cm. (15,000 M.U.) of this tincture was rubbed into the skin twice daily, a total of 600,000 M.U. From Oct. 28th to Nov. 1st 10 rabbit units of progesterone were injected daily intramuscularly, a total of 50 units. Four days later bleeding started and continued for four days.

In this case we were able to replace parenteral œstrone by percutaneous treatment in three successive menstrual cycles. The patient was much impressed by the method, for she was now only dependent upon the doctor for progesterone injections.

CASE 2.—A woman of 29 who had never menstruated. Her uterus was hypoplastic and narrow, but 6 cm. long. She received 5 c.cm. (15,000 M.U.) of an alcoholic tincture of œstradiol benzoate percutaneously twice daily, 60,000 M.U. in all. Subsequently 10 rabbit units of progesterone were rubbed into the skin daily for five days. No bleeding occurred. This failure could perhaps be ascribed to the fact that progesterone was given percutaneously rather than intramuscularly.

Secondary amenorrhœa.—As shown in the accompanying Table we treated 10 cases of secondary amenorrhœa varying in duration from one to fourteen years. Only cases with a severe functional disturbance were chosen, to lessen the likelihood of accidental successes. In 13 menstrual cycles bleeding was induced 7 times. The following are examples:—

CASE 3.—A woman aged 36 who had not menstruated for three years. Here we succeeded twice in producing bleeding with percutaneous treatment. The dose of œstrone in the first cycle was 600,000 M.U. and in the second 400,000 M.U. In the first cycle the mucous membrane showed glandular hyperplasia, which was probably due to 600,000 M.U. being too large a dose even when given percutaneously. A dose of 400,000 M.U. is generally sufficient.

CASE 5.—In the first cycle œstrone only was used, 400,000 M.U. of the tincture being given in twenty days, and there was no bleeding. Then a similar dose of œstrone was given followed by 50 rabbit units of progesterone intramuscularly and bleeding began. This suggests that œstrone treatment is more likely to be successful if it is followed by corpus luteum hormone. It should be emphasised, however, that here again premenstrual changes in the mucous membrane were absent.

Case 6 again demonstrates that œstrone will not induce menstruation unless it is followed by progesterone intramuscularly. In Cases 9 and 11 bleeding could not be brought on by percutaneous treatment with 500,000 M.U. of œstrone and œstradiol benzoate. In contrast to these, in Case 12 percutaneous œstrone followed by the injection of progesterone was successful.*

DISCUSSION

Experiment has shown that œstrogenic hormone dissolved in benzol, ether, or alcohol is completely absorbed through the skin, and clinical observation proves that alcoholic tinctures given in this way are of therapeutic value. Their use has the advantage that the patients are no longer dependent upon injections given by a doctor and can easily treat themselves—a considerable relief to their minds.

* I have since observed another case of secondary amenorrhœa which has shown bleeding from a proliferative endometrium after having received 400,000 M.U. of œstrone tincture percutaneously without subsequent progesterone treatment.

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My experience so far suggests that success is most likely in amenorrhœa if one gives 50 rabbit units of progesterone by injection after 20 days' percutaneous treatment with œstrogenic hormone (400,000 M.U.). It is remarkable that there may be bleeding without the mucous membrane showing the typical picture of the premenstrual phase. I have noticed this also in cases receiving injections of œstrone and progesterone and have formed a new idea of the mechanism of menstruation which I shall report elsewhere. For the patient it is quite irrelevant how the mucous membrane looks—whether she bleeds from a proliferative or a progestational mucosa; whether there is pseudomenstruation or menstruation. It is only important that she does bleed, and since this is attained by simple and "natural" means she can throw off her feeling of inferiority and the subjective disturbances resulting from her missing ovarian functions.

Local treatment with hormone tincture is also worthy of consideration, particularly in arthritis ovaripriva. I have not been able to use it in acne vulgaris and pruritus vulvæ because of the irritation it may produce.

SUMMARY

The œstrogenic hormone is absorbed through the skin, but if it is applied in an oil or ointment the dose needed to produce œstrus in castrated mice is seven times as great as the dose needed when it is injected subcutaneously.

If the hormone is dissolved in benzol, ether, or 96 per cent. alcohol, it is much more readily absorbed through the skin.

A dose of œstrogenic hormone given in this way is just as effective as the same dose injected subcutaneously.

The equal effectiveness of percutaneous application in a suitable solvent has been shown by experiments in which œstrogenic hormone was used to produce œstrus in mice, to reduce the growth of the testes of rats, to inhibit the growth of young rats, and to produce a pituitary tumour in the rat.

In gynæcological practice injections of œstrogenic hormone can be partly replaced by percutaneous applications of alcoholic tincture of œstrone. Progesterone also is absorbed by the skin, but it will have to be injected until it is less expensive, for larger doses are required for percutaneous than subcutaneous administration.

Application of œstrogenic hormone to the skin, followed by the injection of progesterone, will produce uterine bleeding in primary and secondary amenorrhœa.

The rubbing of alcoholic tincture of œstrogenic hormone into the skin is almost as effective clinically as injections of the hormone, but some patients who do not react to percutaneous treatment will nevertheless react to injections.

I am indebted to Dr. M. Tausk (Organon, Oss) for kindly supplying the œstrone (Folliculin-Menformon) and œstradiol benzoate (Dimenformon).

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VITAMIN A AND CAROTINOIDS IN BLOOD

DEFICIENCIES IN CHILDREN SUFFERING FROM XEROPHTHALMIA

BY J. H. DE HAAS, M.D.

AND

O. MEULEMANS, Chem. Eng.

(From the Children's Department of the Medical College at Batavia)

No observations have been recorded on the vitamin-A or carotene content of the blood of children suffering from xerophthalmia. The observations in this paper have been made on the blood-serum of 11 infants (7 native and 4 Chinese) and 16 young children (15 native and 1 Chinese) that were treated in our department between February and May, 1937. The diagnosis of xerophthalmia in every instance was supported in the ophthalmic department by Prof. Mulock Houwer and Dr. Sie Boen Lian.

Among the poorly fed groups of the population in the tropics, infants and young children with xerophthalmia are being constantly noticed. The peculiarity in the children here to be described, however, lies in the fact that the amount both of vitamin A and of carotinoids in their blood has been determined, after it had become apparent that an exact determination is possible with as little as 6–10 c.cm. of blood.

The method is the same as that now in use at the Hygiene Laboratory in Utrecht (Wolff 1936). It consists of saponifying the serum; shaking it with peroxide-free ether; determining the carotinoids; drying over sodium sulphate and evaporating with a current of carbon dioxide; applying Carr and Price's reaction; and determining the blue tint in the Lovibond tintometer.

In the early part of this investigation a few blood samples were examined according to the method originally used in Utrecht (van Eekelen 1931, Menken 1932, 1934), which one of us had had the opportunity of studying there. The difference between the old and the new method is of minor import.

The age of the 11 infants examined, practically every one of which was dystrophic, varied between 7 weeks and 9 months. Of these 11 infants 6 were fed with sweetened skimmed milk, 3 were breast-fed, and 2 had been fed with sweetened condensed milk, not skimmed but possibly too greatly diluted.

Of the 3 blinded infants 1 was breast-fed. The European waste product, sweetened skimmed milk, was responsible for the other 2 cases of blindness (de Haas and Meulemans 1937). The remaining 8—of whom 2 were breast-fed, 4 received sweetened skimmed milk, and 2 too greatly diluted sweetened condensed milk—suffered from a xerosis of the conjunctiva and cornea, with or without the Bitot spots; they could still be treated in time. Such a cruel incident as that by which a mother through her own breast-feeding caused blindness in her child has therefore actually occurred once amongst these infants.

INVESTIGATIONS

In 6 of these 11 infants there was no vitamin A in the blood, and in 3 of the rest only very little—

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4, 6, and 8 international units* (I.U.) per 100 c.cm. of serum. On the other hand, in a Chinese female infant, 7 months old, who had been breast-fed for a month, after which she had been given sweetened skimmed milk with banana and orange juice, 31 I.U. of vitamin A were found on the day before she died of extensive tuberculosis. In a native infant aged 9 months, with perforated corneæ, breast-fed for three weeks, after which he had been fed with sweetened skimmed milk, 22 I.U. per 100 c.cm. of serum was found.

The carotinoid content (without further differentiation) in these 11 infants varied between 12 γ and 56 γ per 100 c.cm. of serum, so that in all instances it was fairly low. Actually the carotene content is still lower, seeing that the chromatographical analysis of the carotinoids was not made. In this investigation the emphasis has been laid upon the determination of the vitamin-A content in the blood, because it is likely to be a more representative measure than is the carotinoid content for determining any deficiency.

In 2 out of the 3 breast-fed infants the mothers' milk did not contain any vitamin A, whilst in the third infant (7 weeks old) there was 14 I.U., the blood of the mother containing 18 I.U. The carotinoid content of the blood of these breast-fed infants varied between 13 γ and 41 γ, in the blood of the mothers it was 18–53 γ, and in the mothers' milk 3–17 γ (all of these per 100 c.cm. of serum). For the average content of vitamin A and carotene in human and in cow's milk reference may be had to our previous publications on these subjects (Meulemans and de Haas 1936, 1938). The figures (Batavia) may be summarised as follows :—

—	International units per 100 c.cm.	
	Vitamin A.	Carotenes.
Cow's milk	±50	±20
Human milk—		
Native and Chinese..	±60	±15
European	150–200	±25

Of the 16 older children (15 native and 1 Chinese), practically all were more or less dystrophic, as is usual here amongst Chinese and native children; except for one aged 7 they were all between 1 and 4 years.

Of the 16, 13 children had been breast-fed during the first year of their life, and of the 3 bottle-fed one had been given diluted fresh milk, one had been fed with sweetened condensed unskimmed milk, and the third with sweetened skimmed milk. After the breast-feeding or the bottle-feeding these children had been fed on rice, vegetables, and a little dried fish, with few secondary adjuncts or none, this being the usual food of the young native child.

Of these 16 children one was totally blind, and two of them half blind. The others exhibited only xerosis and Bitot's spots.

In 13 of these 16 children suffering from xerophthalmia no vitamin A was found in the blood, and the other 3 had 2, 14, and 38 I.U. per 100 c.cm. of serum. No explanation could be found for this relatively high value. The carotinoid contents varied between 8 μg. and 29 μg. per 100 c.cm. of serum.

* Wolff (1936) gives the averages for the vitamin-A contents of the blood-serum in adults the following values: 90–120 I.U. = good; 45–90 I.U. = satisfactory; less than 45 I.U. per 100 c.cm. of blood-serum = insufficient. These values are 1½ times as large as those indicated in the original publication, because the conversion factor of Lovibond "blue units" into international units, which hitherto had been taken to be 4·2, according to a subsequent publication issued by the Hygiene laboratory at Utrecht, is actually 6·4 (van Eekelen, Emmerie, and Wolff 1937). In this article the latter factor is being used in converting the vitamin-A contents into I.U.

METHOD OF TREATMENT

The infants and the other children suffering from xerophthalmia, immediately upon being admitted, were given, besides an adequate diet, subcutaneously 0·5 c.cm. of Davitamon A (Organon) which contains 40,000 I.U. per c.cm., in addition to a continuous daily treatment with cod-liver oil.

If the corneæ are not as yet perforated, practically in every instance a successful result is obtained by means of this treatment, even if no vitamin A be present in the blood. In the course of treatment not a single eye was lost that had not already previously been destroyed.

After treatment the vitamin-A content of the blood increases more or less rapidly, but this, together with various other details not yet indicated here, will be described in a subsequent paper. For the present it may be pointed out that in sick dystrophic children that do not yet exhibit xerophthalmia it may happen that no vitamin A is found in the blood, so that from this communication it may only be concluded that the absence of vitamin A in the serum of children is essential but not necessarily pathognomonic for xerophthalmia.

SUMMARY

1. In infants and young children with xerophthalmia there is as a rule no vitamin A in the blood-serum; sometimes there is a little, and in exceptional cases a trifle more.

2. The carotinoid content of the blood in these cases is also low. The vitamin-A content, however, is more representative than this in judging any A-deficiency.

3. If the cornea has not yet perforated, even though temporarily no vitamin A is found in the blood, treatment with vitamin-A preparations will succeed in relieving the eye affection.

4. Sweetened skimmed milk is an "ideal" food for providing xerophthalmia in bottle-fed infants; the disease is rarely caused by other milk preparations.

5. Xerophthalmia and the practically total absence of vitamin A in the blood has also been met with in *breast-fed* infants, in which case there is in the mother's milk little or no vitamin A, and only a small amount of carotene.

This investigation has been carried out with the support of the Institution for Nutrition Research at Batavia.

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MEDICAL TOUR TO THE U.S.S.R.—The Society for Cultural Relations with the U.S.S.R. is again arranging for a medical party to visit Russia. Opportunities will be given for studying aspects of medicine in which members of the party are specially interested, and Soviet hospitals and medical institutions will be inspected. In order to avoid the holiday season in Russia the party will leave London by sea for Leningrad on Sept. 7th, returning to Hull on Oct. 2nd. The itinerary will include Moscow, Kharkov, and Kiev. Further information may be had from the secretary of the society, 98, Gower-street, London, W.C.1.

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MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE

SECTION OF SURGERY

AT a meeting of this section on May 4th Prof. G. GREY TURNER delivered his presidential address on

Non-malignant Stenosis of the Œsophagus

He said that his special interest in non-malignant stenosis of the œsophagus dated back to an occasion in Newcastle-on-Tyne when autopsy disclosed a wonderful example of fibrous stricture of the œsophagus where malignant disease had been confidently expected. He had always been taught that cancer of the œsophagus was almost the only cause of œsophageal obstruction, but he had been struck by a casual remark made by W. J. Mayo in 1906 that it was always worth while doing gastrostomy because the diagnosis might be wrong! The student who searched the museums would not find very many specimens of simple stenosis, but there was one beautiful example at Bart.'s and a very striking one in the museum of the Royal College of Surgeons of Edinburgh. During the last few years the president had seen many examples of the condition. One that particularly impressed him was in an old woman admitted to hospital as a case of cancer. She was miserably thin, ill, and starved, and on the radiological evidence gastrostomy was carried out. Improvement was so remarkable that further investigations were made, disclosing only a fibrous stricture. Unhappily this patient died; at autopsy the innocence of the stricture was confirmed. Some of these cases were difficult to manage but responded well to treatment. A child, aged 3, in 1910, for example, whom he saw under the care of Rutherford Morison, was so voracious that he was constantly eating and regurgitating whatever was put before him; the stricture was dilated through the œsophagoscope and later by bougies, which he learned to pass himself, and twenty-five years later he was still well and with full swallowing capacity. For years now it had been assumed that strictures could be successfully dilated and perhaps cured under the guidance of the eye through the œsophagoscope, but this was not always successful and was often risky. Perseverance with bougies by the mouth was a safer if slower method which had cured several patients who had defeated the experts with the œsophagoscope. The president recalled a successful case of a woman whose stricture was overcome at first by the retrograde passage of bougies, followed by a rubber tube, the patient being taught later to pass bougies by the mouth. Another method sometimes applicable was cardioplasty following exposure of the œsophagus from the abdomen. The method of anastomosis between the œsophagus and the cardiac end of the stomach was not often indicated, but he had employed it in seven cases with very good results.

The *cause* of fibrous stricture was usually obvious, most cases resulting from the swallowing of corrosive fluids. Other causes could be local or general infections or acute fevers. Mild destructive changes in the œsophagus, the result of regurgitation of very acid or perhaps toxic stomach contents in patients who had lain extremely ill, might occasionally lead to stenosis. Brown Kelly of Glasgow had brought forward convincing evidence that a secondary fibrosing condition might start in association with some mild congenital defect. This was the only explanation in some cases which fitted with the facts.

Diagnosis not of the cause but of the actual condition was usually obvious, but sometimes presented difficulties, patients being treated for apparently innocent stricture which afterwards proved to be malignant.

The *prevention* of stenosis in the presence of such conditions as are almost invariably followed by its development was an important aspect of the question. One school of thought associated with the name of H. Salzer advised the passage of instruments in the very early days, although traditional teaching was in favour of deferring any such treatment until four or six weeks after the accident. The president had seen a perforation of the œsophagus from the bougie on the twenty-sixth day after the swallowing of carbolic acid, and he said he would hesitate very much to use any such dilatation until the stage at which fibrosis had become well developed. The recollection of Prof. John Chiene's dictum, "once a stricture, always a stricture," reminded him to comment on the ultimate condition of patients who had suffered from cicatricial stenosis of the œsophagus. Many of them, possibly the majority, might be permanently cured by persistent treatment, but there was probably a residue of cases in which the tendency to recurrence persisted for many years and possibly throughout life. One of his patients, who first showed signs of such a lesion at the age of three, had been treated with great success, and now at sixteen was able to swallow normal food like the rest of the family; but having of late years neglected the regular use of the bougie, she now got some pain behind the sternum and a radiogram showed a hold-up at the lower end of the œsophagus. Trousseau, the French clinician, had said that a patient using œsophageal bougies would die of the instrument sooner or later, and certainly there was danger in this treatment. The president had not himself witnessed a disaster in his own cases and his experience led him to conclude that the careful self-passage of bougies, blind though it may be, was no more dangerous than more rapid dilatation through the œsophagoscope.

But there were other methods available. The swallowed string, usually associated with the name of Plummer, should be tried in difficult cases before more drastic measures were adopted, though it was sometimes either useless or badly tolerated. Successes had been reported from the retrograde passage of bougies through a gastrostomy. Rapid divulsion and cutting through the stricture with a string saw were both violations of surgical principles. Attempts at excision of a simple stricture with end-to-end anastomosis was impracticable. In cases that had defeated the various methods mentioned there was always the possibility of short-circuiting the disability by making a new œsophagus, and to this end a vast amount of ingenuity had been exercised. The records of the numerous cases in which this plan has been tried suggested, however, that other and simpler means might often have prevailed. A colleague visiting Russia had seen no less than eleven patients in one hospital in Moscow all suffering from simple stricture of the œsophagus, the result of swallowing caustic fluids in suicidal attempts, and all being subjected by the surgeon in charge to treatment by formation of a new œsophagus. Such a wholesale resort to this measure could hardly have been necessary. It was clear that every effort should be made to restore Nature's path before attempting to replace it by a surgical exploit of such magnitude.

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A MOCK TRIAL

FEATHER v. WATSON AT KING'S COLLEGE HOSPITAL

THE members of the Listerian Society, King's College Hospital, promoted a successful mock trial on May 4th. His Honour Judge EARENGEY, K.C., presided.

THE PLAINTIFF'S CASE

Mr. J. MAX MULLER, counsel for the plaintiff, Mrs. Feather, explained that she was 29 years old and living apart from her husband. She sued Dr. Watson for negligence on these facts: She consulted him on Jan. 15th, 1937, complaining of tiredness, nervousness, and palpitation. He diagnosed nervous depression and advised her to go on a sea voyage to the Mediterranean. On Jan. 30th she sailed. The Channel and the Bay of Biscay were very rough, both on the outward and on the return journey. The Mediterranean was infested with Spanish warships, which made her very anxious and spoilt any chance of recuperation. On the return voyage she was thrown down by the rolling of the ship and hurt her head. On her return to England she consulted a specialist named Dr. T. S. F. West, who found that she was suffering from severe exophthalmic goitre. He took her at once into a nursing-home and called in Mr. Hunter, who operated on Feb. 27th. She made an uninterrupted recovery. She now sued Dr. Watson for negligence in failing to diagnose her condition correctly and in treating her in a manner which caused her loss and suffering. She claimed 30 guineas for the cost of the unnecessary cruise, 100 guineas for the operation, 64 guineas for nursing-home fees, and 10 guineas for Dr. West's fee.

Mrs. Feather said in evidence that she had always been highly strung. Her eyes were not prominent before 1937. She had become more nervous since separating from her husband, and had lost weight. She had complained to Dr. Watson of tiredness and of being run down and nervous, with palpitations. She had been much worse by the time she had got to the Mediterranean and had spent most of the time in bed. She had left the ship in a stretcher and had been in bed for a fortnight in the care of Dr. Watson, who had seemed very casual.

In *cross-examination*, she agreed that she had been married at 23 and separated at 25, and had been anxiously hoping for a reconciliation with her husband, which had, in fact, taken place since the operation. She had been losing weight for 18 months. She had talked to Dr. Watson very fully about her matrimonial troubles. At that time she had had no swelling in the eyes or throat. He had told her not to worry and that she wanted a rest, and they had discussed the matter.

In reply to his Lordship, she agreed that she had felt very nervous on account of the Spanish troubles in the Mediterranean but had not thought of them before starting, her geography not being very good. She agreed that she studied her appearance from time to time in the mirror, and that up to Jan. 3rd she had not noticed anything wrong with her throat or eyes. She had thought that her heart was wrong.

Dr. Alister Maclagan, surgeon on s.s. *Empress of Abyssinia*, said in evidence that he had seen Mrs. Feather on the second day out, when she was very sea-sick. He had noticed a very rapid pulse and slight exophthalmos and had supposed that she was a known exophthalmic patient sent for a voyage before operation, and was surprised that her general practitioner had not written to him. He had done his best to keep her in bed, but she had got up and done more than he would have advised. The roughness of the sea made her very ill, and fright in the Mediterranean contributed. He had told her she was suffering from thyrotoxicosis.

Cross-examined, he maintained that her condition was getting worse, while her disease was steadily maintained throughout the voyage. By that he meant that mentally she was worse and physically the same. He agreed that the first day out on the cruise was an interesting day but would not admit that it was an unpleasant one. The sea had been "fairly rough" but not "rough." In the presence of brisk reflexes and tachycardia he would expect thyrotoxicosis. He agreed with the Judge that separation from her husband and anxiety about it would tend to the development of this trouble.

Dr. T. S. F. West said that Mrs. Feather had told him she had no general practitioner but came on Dr. Maclagan's recommendation. She was obviously suffering from severe Graves's disease, with slight exophthalmos, wasting, tremor, some enlargement of the thyroid, pulse 130, and blood pressure 145/75. She needed operation at once, and he had arranged for it. She must have had Graves's disease when Dr. Watson had seen her. This condition was difficult to diagnose but the possibility should be borne in mind. He would have expected a doctor at least to take the blood pressure, and to see whether a rapid pulse was transient or permanent.

Cross-examined, he agreed that he had seen Mrs. Feather for the first time six weeks after Dr. Watson had seen her. Tachycardia, brisk reflexes, and the general picture were enough to arouse suspicion of thyrotoxicosis. He admitted that there were other causes of tachycardia, such as alcohol, tea, and physical exertion, and that all neurotic patients were not inevitably hyperthyroidic. He admitted that a general practitioner must go very slowly in these matters.

Mr. M. C. Hunter, the surgeon, said that Mrs. Feather had shown obvious signs of exophthalmic goitre, though the eye appearance was not severe. He had found her basal metabolic rate to be +55 per cent. He thought she had had the disease in January but that the voyage had probably made it worse.

Cross-examined, he said that if he had not operated he would have put the patient to bed and tried the effect of iodides and medical treatment. He accepted what Dr. Watson had found but regarded it as incomplete. Blood-pressure reading should have been taken. The taking of a blood pressure was not deleterious to health. The doctor who was assessing his patient's condition with a view to sending her abroad ought to be sure of his diagnosis first.

Mrs. Feather was recalled on the quantum of damages, and this concluded her case.

THE DEFENCE

Mr. DAVID KARMEL, counsel for Dr. Watson, said in opening the defence that the plaintiff must prove that she had suffered from hyperthyroidism on Jan. 15th, that she had suffered damage because she had not been operated on until Feb. 23rd, and that Dr. Watson had been negligent in not diagnosing Graves's disease on Jan. 15th. The degree of skill required by law from Dr. Watson was only the reasonable degree of care and skill that a prudent person would exercise when examining a patient. It was not as high a degree as would be expected of a specialist. Dr. Watson could not be expected to diagnose an unusual disease like hyperthyroidism. He

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had had a nervous patient, had very reasonably thought that she was suffering from a degree of neurasthenia, and had prescribed a perfectly proper treatment.

Dr. Watson said in evidence that Mrs. Feather was a very neurotic woman with a neurotic past history and had ample cause for her present state in her matrimonial troubles. He had found her nervous with very brisk reflexes, and very voluble. She had had no exophthalmos but a little tachycardia; she had been excited. There had been no obvious thyroid enlargement. He did not think she had hyperthyroidism then. He had thought of it as a possibility but had not felt justified in putting her to the expense of investigation. He had not taken her blood pressure, and said that even insurance companies did not ask for the blood pressure of applicants under fifty-five. He thought that the hyperthyroidism had been brought on by fright over the Spanish warships. He had intended to treat it, but had considered that she first needed rest. He had said nothing to her about consultation or investigation, because there had been no use in worrying her. She had gone to Dr. West without his knowledge.

Cross-examined, he said that he had seen thyrotoxicosis before but had seen a greater number of cases of neurasthenia. All the symptoms of nervous depression appeared also in Graves's disease. A Mediterranean trip would not harm a Graves's patient. No steps that he could have taken would have satisfied him that she had Graves's disease.

Re-examined, he said that she had no dilatation of pupils or dampness of hands.

Mrs. Trotter, the stewardess who had attended to Mrs. Feather on the liner, said that she did not think Mrs. Feather was ill, although she was fussy and a perfect nuisance. She had been nervous about the Spanish warships, but none had ever appeared.

Sir Thomas Standstill, the greatest living expert on diseases of the thyroid, who gave his address as c/o Moss Bros. and said he also had a sofa in Harley-street, agreed that many symptoms were common to neurasthenia and thyrotoxicosis. He said that he had not seen Mrs. Feather during her illness. This type of case was very difficult to diagnose, as the symptoms of simple neurasthenia and mild hyperthyroidism might appear identical. Dr. Watson's diagnosis of nervous debility might have been perfectly correct. A sea voyage would be admirable treatment for a mild case of Graves's disease, as a preliminary to an operation. The blood pressure would not necessarily tell a general practitioner whether a patient had Graves's disease. A reading such as had been given in evidence was not abnormal. The tests which had been mentioned were not necessarily diagnostic of Graves's disease. The symptoms Dr. Watson had found, coupled with those he had not found, were consistent with a negative diagnosis. A basic principle of treatment was to put the patient into fresh surroundings.

THE SUMMING-UP

The learned judge summed up strongly in favour of the doctor, but the jury, after a considerable absence, returned a verdict for Mrs. Feather with damages at 30 guineas, finding that the doctor had been negligent and that the patient had thereby taken an unnecessary cruise, but that none of her other loss had been due to his negligence.

The audience, on appeal, found by a large majority for the doctor.

Replying to a general vote of thanks, Judge Earengey said that the trial, besides being carried out admirably, must have served a valuable purpose in showing junior medical men the way in which courts did their work. It would help them to overcome the dislike which most doctors felt at first for the legal system which occasionally drew them into the courts as witnesses and subjected them to what they might consider as a certain amount of pulling-about in cross-examination. When they came to the courts as parties they had much stronger grounds for anxiety, because no one could tell what a jury would do. He strongly recommended every practitioner to insure himself by membership of a defence society.

REVIEWS AND NOTICES OF BOOKS

A Textbook of the Practice of Medicine

Fifth edition. By Various Authors. Edited by FREDERICK W. PRICE, M.D., C.M., F.R.C.P., F.R.S. Edin., Consulting Physician to the Royal Northern Hospital; Senior Physician to the National Hospital for Diseases of the Heart. London: Humphrey Milford, Oxford University Press. 1937. Pp. 2038. 36*s*. (India paper, 45*s*.).

FEW can appreciate the rapidity of the advance of medicine better than the conscientious editors and authors of text-books. The amount of rewriting and revising that four years have called for in Dr. Price's book is surprising; it involves not merely the addition of new information but alterations in presentation, the discarding of views and practices no longer current, and a shifting in many places of the emphasis and the perspective. It is to the credit of Dr. Price and his collaborators, most of them senior men, that so much of this has been done. Five of the contributors to the fourth edition have been removed by death. Their successors are Dr. Maurice Campbell, who revises the section on diseases of the blood-vessels; Dr. A. E. Gow, who collaborates with Lord Horder; Prof. J. W. McNee, who writes a new section on diseases of the spleen and the reticulo-endothelial system; Dr. F. M. R. Walshe, who revises the neurological articles; and Prof. Mapother and Dr. Aubrey Lewis, who conclude the book with an excellent short presentation of psychological medicine. Two thousand pages make a bulky volume; so the publishers this time offer an alternative edition on India paper, which is delightful to handle though it needs to be read in a very good light. "Price," in London at least, is probably the students' favourite among the larger text-books of medicine. This edition bids fair to maintain its prestige, and to fulfil its editor's wish that it should be considered "not unworthy of English medicine."

Handbook of Practical Bacteriology

A Guide to Bacteriological Laboratory Work. Fifth edition. By T. J. MACKIE, M.D., D.P.H., Professor of Bacteriology, University of Edinburgh; and J. E. MCCARTNEY, M.D., D.Sc., Director of Research and Pathological Services, London County Council. Edinburgh: E. and S. Livingstone. 1938. Pp. 586. 12*s*. 6*d*.

THE continued popularity of this handbook is easy to understand. A great deal of accurate information is compressed into a volume of small size. The subject is presented, as an experimental science should be, from the practical standpoint. The

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technical methods given are good ones and are so clearly described that beginners will have no difficulty in getting the desired results if they follow the instructions with care. But over and above its use as a guide to sound technique this book provides an excellent general introduction to the study of bacteriology. Supplemented by the usual teaching of a medical school it should give the ordinary medical student all he needs and one who intends to specialise a sound basis for further work. The new edition has been thoroughly revised and the newer work on such subjects as the streptococci, food-poisoning, and the filtrable viruses is presented with judgment. There is in fact everything to praise and nothing to criticise in this excellent little book. Our only hope is that in future editions the authors will resist any temptation to enlarge it.

The Practice of Refraction

Third edition. By Sir STEWART DUKE-ELDER, M.D., Ch.B., F.R.C.S., Surgeon-Oculist to H.M. The King; Ophthalmic Surgeon and Lecturer in Ophthalmology, St. George's Hospital. London: J. and A. Churchill. 1938. Pp. 371. 12*s.* 6*d.*

THIS book has retained its practical and clinical character. It sets out the essential principles of the theory and practice of refraction and the correction of defects in the optical system of the eyes and their associated muscles. Descriptions of mathematical proofs have been omitted deliberately. The new matter in this edition includes a broad outline of such problems as aniseikonia, orthoptic exercises, dynamic retinoscopy, muscle imbalance, and contact glasses. For technical details the reader is referred to special monographs. It is good to see the emphasis laid on the assiduous and painstaking practice required before efficiency in refraction work can be achieved. This book provides a lucid and readable guide for the beginner.

Treatment in General Practice

Third edition. By HARRY BECKMAN, M.D., Professor of Pharmacology at Marquette University School of Medicine, Milwaukee, Wisconsin. London: W. B. Saunders Company. 1938. Pp. 787. 42*s.*

THIS book shares a fault common to many books on therapeutics written by specialists for general practitioners. The descriptions are not detailed enough. The author assumes that the practitioner should try something simple and, if it fails, should refer the case forthwith to a consultant, quite forgetting that if (as sometimes happens) the consultant fails, the burden of treatment falls once more upon the practitioner, whose knowledge of therapeutics should therefore be, and often is, extensive and peculiar. This edition, though it includes much new material, is no more bulky than its predecessors, whence the author congratulates himself on having learnt to be brief. When, however, reference to collapse therapy in tuberculosis is limited to six lines, some may think that brevity ceases to be a virtue. Prof. Beckman is needlessly sceptical about the value of endocrine extracts other than thyroid in the treatment of amenorrhœa, and only lukewarm about cortical extract for Addison's disease; he makes no reference to the comfort to be derived from valerian or to the uses of anterior pituitary and œstrin in the disorders of the menopause. Nevertheless an immense field of therapeutics is covered or at least touched upon in this edition and there are plenty of valuable suggestions; among them we noticed specially the notes on methods of treating burns, on the use of trichlorethylene in tic douloureux, and of pituitary extract in post-herpetic neuralgia. Except for the pernicious vomiting of pregnancy and eclampsia obstetrical matters have been deliberately omitted and so has the treatment of drug-addiction and of certain tropical diseases. Especially commendable from the practitioner's point of view is the chapter on the anæmias which are classified according to their therapeutic response.

Essentials of Psychiatry

Third edition. By GEORGE W. HENRY, Associate Professor of Psychiatry, Cornell University College, New York. Baltimore: Williams and Wilkins; London: Baillière, Tindall and Cox. 1938. Pp. 465. 22*s.* 6*d.*

Manual of Psychiatry and Mental Hygiene

Seventh edition. By AARON J. ROSANOFF, Los Angeles, California. London: Chapman and Hall. 1938. Pp. 1091. 37*s.* 6*d.*

Principles and Practice of Clinical Psychiatry

By MORRIS BRAUDE, M.D., Associate Clinical Professor of Psychiatry, Rush Medical College, University of Chicago. Philadelphia: Blakiston's Son and Co. 1937. Pp. 382. 18*s.*

THESE three text-books indicate the importance attributed to dynamic psychological interpretations in American psychiatry, and the bareness of the knowledge upon which such interpretations still rest in the United States as elsewhere. The psychobiological passages in the works by Dr. Henry and Dr. Rosanoff are sensible and useful as far as they go. But they seem stale, vague, and a trifle perfunctory in comparison with the detailed information, including the fruits of much research reported since their last editions, which they are able to give in the other pages of their books. It is not that the authors are half-hearted in advocating and presenting this aspect of psychiatry, but that they cannot, except by invoking Freudian psycho-analysis, find anything precise or novel to say; they are, it is true, benevolent towards psycho-analysis, but with the qualified benevolence of a fair-weather patron. No one, however, who had read these or other modern text-books could have any excuse for continuing to talk of the "descriptive psychiatry" of the "alienist." Dr. Henry's new edition is considerably enlarged, and is an admirable, reasonably comprehensive, conventional presentation of the subject. The references given in the text—mainly to American articles—are numerous and well selected, and there is a list of relevant books in the English language which shows what an unmanageably wide field the psychiatrist has to cover: he is lucky if he escapes sciolism.

Dr. Rosanoff's book is of a more ambitious kind. Himself an active research worker, he seems to have had readers with similar interests in mind, and the outcome has been a well-documented, learned, but not very well-proportioned survey of the present position. With an unusually wide, though erratic, grasp of the literature, especially on those topics which he has himself studied, and a strong bias towards an ætiological classification based on organic pathology, he is evidently now unable to produce as easy and consecutive an account of the whole subject as he supplied in his earlier editions; most of the book has been rewritten. Dr. Rosanoff's method of presentation is peculiar and at times eccentric; his

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attempt to split up schizophrenia into psychoses of traumatic, infectious, and other organic and toxic ætiology, leaving a residue to be dealt with under the heading of chaotic sexuality, is at best premature, and in its present form decidedly unsuccessful. The book is swollen with two hundred pages of information about psychological and other diagnostic procedures, and by more than a hundred case-records. This work, with its strongly individual point of view, is now less suitable for the medical student than for the graduate.

Dr. Braude's book is on a different level from the other two. It puts the essentials of the subject simply, evades problems that might perplex the beginner, and is enlivened by illustrations from history and literature. It would be a queer student who could make against the psychiatry here presented that common complaint "It's all above my head." The work is however too superficial and easy-going to be worthy of its imposing title, though its chapters might serve as the basis of clinical lectures designed to hold the attention of students while giving them a rough knowledge of the subject. The style is wordy, and the bibliographies given at the end of each chapter are almost satirical comment on the custom of sending students to the original sources. The references, mostly limited to publications of the last seven years, are drawn from an amazing miscellany of journals; there are no less than sixteen references appended to a chapter containing only seven pages, and of these sixteen papers one is in Russian, one in Japanese, and another in Spanish. A bibliography in a text-book designed for students should surely be selected from works that are likely to be accessible to him and limited to key articles. If he wants to pursue a subject he will find therein pointers in the right direction.

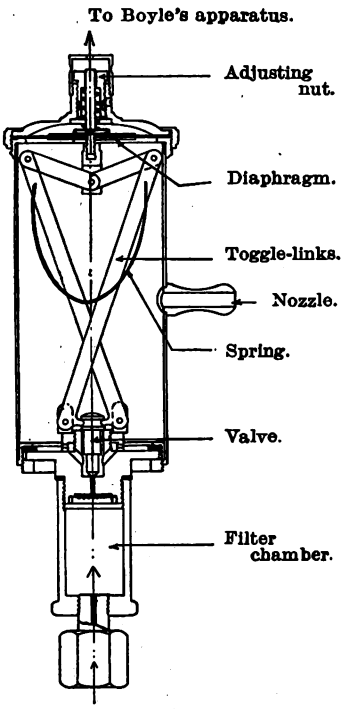
NEW INVENTIONS

A LOW-PRESSURE REDUCING CHAMBER FOR ANÆSTHESIA

Boyle's apparatus has become the standard British machine for the administration of nitrous oxide, oxygen, and ether in this country and because of its simplicity it is likely to remain so. There are better machines but they are generally too expensive for use by the general practitioner.

I have had certain alterations made to a Boyle's apparatus that I think improve the machine. I use the Evans type of stand to hold gas-and-oxygen cylinders, with a small fitting on the side to hold a carbon dioxide "Sparklet." The principal change in the machine is a new type of reducing valve that works at a very low pressure. There are two of these reducing valves, one for oxygen and one for nitrous oxide, and they are fitted to a coupling that joins two gas and two oxygen cylinders.

The reducing valve consists of a chamber for reducing the pressure, which is done by a system of toggle-links and a valve, as shown in the Figure.



THE REDUCING CHAMBER.

On opening the cylinder valve the gas passes through a filter chamber to ensure that no foreign matter enters the reducing chamber. With the adjusting nut slackened off, the gas will not pass the valve, which is operated by a pair of toggle-links kept in tension by a spring, the toggle-links being connected to a diaphragm. By screwing down the adjusting nut on to the diaphragm, the toggle-links lift the valve and allow the required amount of gas to pass into the chamber and out through the nozzle to the rubber tube and thus to Boyle's bottles. The apparatus is made by the Dental Manufacturing Company, London, W.1.

The great advantages of the very low-pressure reducing valve is that when the machine is being used for endotracheal work it is impossible to give too high a pressure of gas or oxygen. The pressure at which the gases are running is so low that, by shutting off the rebreathing bag, an increased flow of gas is sucked in by the patient.

If it is desirable to give a sudden extra supply of oxygen to the patient, all that need be done is to shut off the rebreathing bag, turn off the nitrous oxide, and the negative pressure on inspiration will immediately and automatically enable a large dose of oxygen to be inhaled. For example, oxygen is flowing through two holes in the mixing bottle and the rebreathing is shut off; when the patient inspires, oxygen will flow through all the holes and out of the extra outlet of the tube as well. The pressure can be varied within limits by turning a screw at the top of each reducing valve. When the anæsthetist wishes to give a full flow of gas he simply opens the by-pass on the Boyle's bottle and the resistance of the water in the bottle being removed, there is an immediate full flow of gas without any change of the adjusting screw.

I have not used flow meters in my machine because of their expense and I think that the average general practitioner anæsthetist will feel the same about these, excellent though they may be.

To the metal part of the rebreathing bag I have attached a small inlet tube that just fits the outlet tube of an ethyl chloride container, so that if one desires to give ethyl chloride in the induction period, this can be sprayed into the bag as desired.

The nitrous oxide low-pressure reducing chamber can be used for the administration of nitrous oxide and air in midwifery by using some intermittent-flow device, such as the D.M.C. carburettor. Low-pressure gauges may be fitted to the reducing chamber, and the nitrous oxide chamber should always have one of these gauges if it is to be used for the administration of analgesia in labour.

High-pressure gauges are attached to the couplings joining the gas-and-oxygen cylinders to enable the anæsthetist to know approximately how much they contain.

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Consulting Anæsthetist to the British Hospital for Mothers and Babies, Woolwich.
New Barnet.

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THE LANCET

LONDON: SATURDAY, MAY 14, 1938

DOCTORS AND THE HERBERT ACT

THERE are precedents which encourage the belief that Parliament cannot always think of everything. Some of them indicate that the matters likely to be overlooked are those which concern the medical profession. Whether the community intends it as a compliment or not, doctors are generally taken for granted. Last July the Matrimonial Causes Act, associated with the name of Mr. A. P. HERBERT, M.P., gave husbands and wives the right to petition for divorce on the joint grounds of incurable insanity plus five years' detention in a mental hospital. The degree of the patient's curability is a fact which can scarcely be established without medical testimony. Any approach to the topic of lunacy certification inevitably recalls to the medical practitioner the shock of such verdicts as were given in Harnett *v.* Bond and similar cases. Once bitten, twice shy. It may be that the doctor's testimony under the relevant provision of the Herbert Act will be immune because all evidence given in a court of law is absolutely privileged. If there be any doubt about this, doctors may fairly demand its elucidation. But that is not the end of the matter. The practitioner still owes the patient the duty of non-disclosure. Thus once again there emerges the hackneyed question "Should a doctor tell?"

The five-year period of detention, one of the two points to be established by a petitioner, should be susceptible of easy proof. Yet even here there lurks a difficulty. The period, as defined in the Act, may include any period of voluntary treatment under the Mental Treatment Act of 1930, provided that the voluntary period follows immediately upon the conclusion of a period of detention on order or inquisition. If the patient has been released from detention and transferred to voluntary treatment, the fact may well suggest to the judicial mind that the mental illness is showing signs of improvement. In such a case there may be almost a presumption against incurability. What will be the effect upon the other point to be proved by the petitioner—namely, that the respondent is "incurably of unsound mind"? Here the judges, accustomed to sift evidence and to arrive at conclusions of fact, will no doubt face the question without undue fear. The medical witness will express his opinions and expound the reasoning and experience on which they are founded; those opinions will by no means be final. The judge will listen and allow such weight as he deems fit, applying a legal rather than a medical standard of insanity; he himself will decide the issue of curability. Expert views will doubtless vary. Some will deem recovery after five years as highly improbable; others will be more optimistic. At a recent meeting of the Medico-Legal Society Mr. Justice TRAVERS HUMPHREYS observed that the occasional miracle might occur in any type of case. "All that any court or doctor can do is to say, 'Taking into consideration all the well-known facts of the case, we think it so unlikely that this person will ever be cured for the purpose of leading a reasonable married life that we will regard him as incurable in the sense of the Act.'" If this be the official view, it is a helpful indication.

There remains, however, the dilemma of professional secrecy. The new law, as Mr. LATEY reminded the Medico-Legal Society, permits a mental patient to have a decree of divorce pronounced against him without his even knowing that a petition has been filed. If at the end of the five-year period the patient is undergoing voluntary treatment and not detention, will he not be entitled to full information of what is afoot? Voluntary treatment is a compromise and an anomaly; the patient can take his discharge and walk out of the hospital in which he voluntarily resides. If so, do not the medical practitioners who treat him owe him the duty of secrecy? Normally, as Dr. RICHARD DURAND wrote lately in our columns, they would probably not hesitate to discuss the health and prospects of a husband with a wife or vice versa. But, if husband and wife are on opposite sides in litigation, has not the practitioner an obligation to refuse his evidence on the grounds of professional confidence? Parliament ought to offer some solution of these problems which it creates. Last Monday, during discussion of another Bill for the general amendment of legal procedure, Mr. HERBERT formally expressed regret that the Bill omitted to alter his own recent Act so as to clear up this and other difficulties which were already defeating its good intentions. Perhaps he will pursue this point further at a subsequent stage. The ideal solution may well be that of those critics who say that our whole system of lunacy certification should be overhauled and that the duty of certifying should be entrusted to panels of official examiners. The Matrimonial Causes Rules at present prescribe that, in proceedings for nullity on the ground of impotence or incapacity, the petitioner must apply for the appointment of medical inspectors to examine the parties. Cannot this arrangement be extended to obtain the independent opinion of experts upon the question of curability?

WAYS OF GIVING SEX HORMONES

WHETHER an endocrine preparation is effective by mouth seems to depend on its chemical complexity. The active principle of the thyroid, which is probably a tripeptide containing the amino-acids thyroxine and diiodotyrosine, is a comparatively simple compound and can be absorbed through the mucous membrane of the small gut so freely that parenteral injection is unnecessary.

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Theoretically the sex hormones, which are sterols, should also be absorbable from the alimentary tract, and this is certainly true of the œstrogens, for œstrin by mouth often yields spectacular results in the menopausal syndrome. Œstriol is absorbed in larger proportion than œstrone when given by this route, though it is less potent when injected; but either of these forms is suitable for oral use, provided one bears in mind that the dose must be (according to various estimates) between five and thirty times as high as the dose for injection. Progesterone and the androgens, being sterols, should also be absorbed from the intestine; but the technical difficulty of obtaining high enough concentrations prevents their being given in this way. At the moment there is no convincing evidence that any other hormone is effective by mouth, and the oral administration of polyglandular mixtures is likely to be correspondingly valueless. This is true of anterior-pituitary preparations as well as others; for the confidence of some clinicians in their efficacy is not borne out by animal experiment.

In the treatment of diabetes insipidus, posterior-pituitary extract is often prescribed in the form of snuff, and some of the unpleasant symptoms arising from infrequent injection of large doses may thus be avoided by frequent inhalation of small ones. It was hoped that anterior-lobe hormones likewise might be absorbed from mucous membranes, but gonadotropic extracts have in practice proved ineffective when placed in the vagina. Œstrogens, on the other hand, can certainly be given in this way, and vaginal suppositories are sometimes employed in the treatment of local vaginal lesions associated with ovarian deficiency. On another page of this issue Prof. BERNHARD ZONDEK writes on the application of hormones to the skin, which in the case of the œstrogens may be preferable to ingestion, since it allows of more complete absorption, especially (he finds) when an alcoholic tincture is used. Such a tincture is an improvement on the œstrogenic ointments previously devised by ZONDEK which have been used chiefly in cases of subnormal mammary development, being applied locally to the breasts. Mammary tissue appears to be specially sensitive to this form of œstrogenic stimulation; indeed males employed in packing ampoules of œstrogenic material are apt to develop tender swelling of the breast from the continual handling of the œstrogenic compounds. The success of percutaneous administration has even led to the inclusion of œstrogens in cosmetic creams, but "hormone face creams" enjoy an undeserved popularity when they claim to have specific properties as skin foods. Their promiscuous distribution is, moreover, not without danger, for if they have an appreciable content of œstrogen and are applied continuously as recommended they may derange the menstrual cycle, if they do nothing worse.[1]

To get satisfactory results from endocrine preparations, then, most of them have to be given by injection, and the sterol hormones, which are soluble in high concentration only in oil, have to be injected intramuscularly. This introduces the problem of how to prolong the action of single doses so as to avoid frequent injections. It has been found that the duration of effect is directly proportional to the insolubility of the compound in the body fluids, and this principle underlies the use of the new insulin compounds, such as zinc protamine insulin. In endeavouring to reduce the solubility of the sex hormones it has been discovered that their administration in the form of an ester, such as œstradiol benzoate or testosterone propionate, considerably lengthens the period of action, so that a constant level of effect may be obtained by twice-weekly injections of the former and weekly injections of the latter. Progesterone is more difficult to esterify, and at present no progesterone ester is available for clinical use, though progress is being made in this direction and reports have appeared of a progesterone ester that is effective by mouth. A method of obtaining a far more prolonged action has, however, been invented by DEANESLY and PARKES [2]—namely, the subcutaneous implantation of a tablet of compressed crystals of the pure hormone, from the surface of which the active principle is absorbed continuously in small quantities. This method is now being tested clinically, and its use in controlling the menopausal symptoms of a young female castrate has been described by BISHOP,[3] who found that a 14 mg. tablet of crystalline œstrone appeared to be effective for four or five weeks. Experiments are in progress to determine the most suitable shape and weight for the tablets.

[1] See *J. Amer. med. Ass.* April 9th, 1938, p. 1194.

THE PREMATURE INFANT

THE announcement in our last issue that the Royal College of Physicians of London has approved a "standard" of prematurity, based upon the birth-weight of 5½ lb. or less, represents a stage in an effort to improve the chances of the premature infant. During recent years the death-rate in the first month of life has not been reduced in anything like the same proportion as the general infant mortality-rate, which covers the first year. Roughly speaking about half the deaths in the first month can be attributed to prematurity; but there are variations in different parts of the country, and even in the same institution, according to the standards used. The dangers of being born early were well brought out by CAPON [4] in an address at the Royal Society of Medicine two years ago, and HESS [5] says that in Chicago nearly 60 per cent. of infants dying under thirty days of age are described as premature. It is generally felt among pædiatricians, and especially those associated with maternity hospitals and units, that more could be done for this group of infants;

[2] Deanesly, R., and Parkes, A. S., *Proc. roy. Soc.* B, 1937, 124, 279; see also *Lancet*, 1937, 1, 1354.
[3] Bishop, P. M. F., *Brit. med. J.* April 30th, 1938, p. 939.
[4] Capon, N. B., *Proc. R. Soc. Med.* 1936, 29, 1189.
[5] Hess, J. H., *J. Amer. med. Ass.* 1936, 107, 400.

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and it is clearly worth doing, for if they can be steered over the early weeks of life the large majority grow into healthy boys and girls.

An attempt to tackle the problem has been made in recent years in Chicago with good results,[5] and an essential feature of the scheme there has been prompt notification of all premature births to the health authorities. If such a plan is to succeed it is evident that some sort of standard is necessary, and while experts can all describe what they mean by a premature baby they become somewhat vague when asked to frame an easy "definition." Questions to a public authority administering a large area with twenty-two maternity units showed that, in the returns in which premature babies were listed, eleven hospitals used no standard, four used weight alone (varying between 5 lb., 5¼ lb., and 5–5½ lb.), six used weight plus other considerations, and one used a length standard only (less than 18 in.). Strictly speaking, "prematurity" must mean a baby born before the full period of gestation; but it is notorious that the menstrual history is often unreliable and what matters essentially is that an infant born at supposed full term or less is "immature." Clearly a full-term twin may be small enough to have many of the characteristics of a "premature" baby, and hence the weight standard probably gets nearest to a simple means of defining what is meant by "prematurity."

In seeking for guidance the various bodies concerned (the Royal College of Physicians, the British College of Obstetricians and Gynæcologists, the section for the study of disease in childhood of the Royal Society of Medicine, and the British Pædiatric Association) have naturally paid attention to standards in use in other countries. The classical work of YLPPÖ [6] has had great influence on the Continent and 2500 g. or less is very widely used in Europe, a figure to which the 5½ lb. standard is approximately equivalent. The children's bureau of the United States Department of Labor had the matter under consideration some years ago and has accepted the basis of a weight standard of 2500 g. (DUNHAM [7]). This is in accordance with resolutions passed three years ago by the American Academy of Pediatrics,[8] which included the following: "A premature infant is one who weighs 2500 g. or less at birth regardless of the period of gestation." The proposal emanating from the Royal College of Physicians says the same thing in possibly a more exact manner. The essential feature of all the discussions and proposals is the weight of 5½ lb., and it should be comparatively easy to induce health authorities and maternity institutions to adopt this. Having the uniform standard established, the next step will be to see where are the good and where the bad areas in the country for premature infants. What is done in the better areas can then be studied in the hope of its being applicable to the worse.

ANNOTATIONS

SALT AS A THERAPEUTIC AGENT

How many medical men, asked to select the ten most valuable drugs, would include common salt on their list? And yet it has an undoubted claim; indeed few would omit it once they had thought of it in this connexion. Of its many uses we may here mention two, one of which is new. In the United States Sandstead and Beams [1] claim that administration of sodium chloride in large doses (0·25 to 0·5 g. per kg. body-weight per day) leads to complete or almost complete relief of the pain of diabetic neuritis and to improvement in the peripheral circulation of elderly diabetics. If this claim should be substantiated, the physician with diabetics under his care will be provided with a much-needed remedy. In India Chakravarti and Tyagi,[2] under the title of "studies in effects of heat," describe 10 cases of collapse during the hot weather at Allahabad. In all 10 there were signs of severe salt deficiency and its attendant renal complications, and it is clear that these patients would probably not have collapsed if they had been taking enough salt with their food. These are glaring examples of serious deficiency disease. It is axiomatic that for one example of a frank deficiency disease there must be hundreds of other masked and subacute forms in the same district. The observation of Chakravarti and Tyagi therefore support the view already expressed in our columns,[3] that mild degrees of salt deficiency must be a common source of chronic ill health in the tropics.

PROSTIGMIN AND INTESTINAL MOTILITY

PROSTIGMIN, investigated in 1931 by E. Stedman as a stimulant of the parasympathetic system, has been used by several observers to increase intestinal activity and in particular to relieve post-operative intestinal atony and distension. This synthetic compound resembles physostigmine in its action on the alimentary tract, but in therapeutic doses has little action upon the cardiovascular system or the eye. In 1934 Carmichael and others,[9] reporting to the therapeutics trials committee of the Medical Research Council, confirmed its freedom from side-actions on the circulation and eye in doses up to 0·0015 g. The drug increased the activity of the intestine, but the contractions and relaxations it induced had no propulsive quality, so that the evacuation of flatus or fæces usually required additional treatment in the form of enemata or pituitary extract. In the cases recorded the drug was given in one or two doses at wide intervals. Harger and Wilkey [10] now report their experience with prostigmin in 175 cases of post-operative distension or ileus and record excellent results in the prevention or treatment of these conditions; in their experience it gave relief in the majority of cases without any further assistance

[1] Sandstead, H. R., and Beams, A. J., *Arch. intern. Med.* March, 1938, p. 371.
[2] Chakravarti, D. N., and Tyagi, N., *Indian J. med. Res.* January, 1938, p. 791.
[3] McEwen, O. R., *Lancet*, 1935, 1, 1015; McCance, R. A., *Ibid*, 1936, 1, 767.
[6] Ylppö, A., *Jb. Kinderheilk.* 1919, 24, 1.
[7] Dunham, E. C., *J. Pediat.* 1936, 9, 17.
[8] *J. Pediat.* 1936, 9, 104.
[9] Carmichael, E. A., Fraser, F. R., McKelvey, D., and Wilkie, D. P. D., *Lancet*, 1934, 1, 942.
[10] Harger, J. R., and Wilkey, J. L., *J. Amer. med. Ass.* April 9th, 1938, p. 1165.

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from enemata and the like. The doses employed were similar to those used by Carmichael and his colleagues (namely, 1–2 c.cm. of 1/4000 prostigmin methyl sulphate); but they were repeated at intervals of 2–4 hours until improvement resulted, and as many as nine doses were employed on occasion without any unpleasant effect.

Prostigmin belongs to the group of drugs that inhibit the action of the enzyme choline-esterase present in the blood and tissue fluids. These anti-cholinesterases impede the destruction of any acetylcholine produced in, or introduced into, living organisms. The action of the parasympathetic system upon the intestinal movements is cholinergic —i.e., it is associated with the production of acetylcholine at the nerve-endings in the intestinal wall—and anything that tends to preserve the acetylcholine so formed may augment the peristaltic activity produced. In experimental work the augmentation of acetylcholine effects is usually obtained by continuous perfusion of the tissue with a solution containing an anti-cholinesterase. It appears possible that the greater efficacy of prostigmin in repeated doses, as employed by Harger and Wilkey, depends upon the maintenance of a more uniform state of acetylcholine preservation in the body than can be achieved with a single or widely spaced doses. If this interpretation of the action of prostigmin is correct, it offers a reasonable explanation of the different findings of Carmichael and of Harger and Wilkey, and indicates the therapeutic importance of repetitive dosage.

ATELECTASIS AFTER ANÆSTHESIA

A RECENT discussion[1] at the Royal Society of Medicine showed substantial agreement among physicians, surgeons, and anæsthetists that collapse of the lung is generally the result of obstruction to a bronchial tube. But several speakers then cited cases in which no such obstruction was present, especially when atelectasis followed rapidly on external injury to the thorax. The nature of the anæsthetic was felt to bear only indirectly on the production of atelectasis, the salient predisposing factors being the site of operation, its duration, and the condition of the patient before operation. O. M. Jones and E. E. Burford have now[2] described massive collapse following administration of Cyclopropane in which atelectasis was in their opinion due to absorption of gases in the alveoli. They point to the great variation in the rate of this absorption in relation to the gases present. Anæsthetic vapours, oxygen and carbon dioxide are all absorbed in minutes whereas the inert gases—nitrogen, helium, and hydrogen—require hours. Bearing this in mind, it is easy to see the possibility of massive collapse following cyclopropane inhalation without any bronchial plug. As the inhalation continues the bronchial atmosphere may become devoid of inert gas except for the small amount of nitrogen brought from the tissues to the lungs by the blood in simple solution and diffused into the alveoli. As the blood normally contains about 1 per cent. nitrogen the amount so brought would have little effect in alveoli accustomed to a nitrogen tension of 80 per cent. When the alveoli have lost the supporting properties of the inert gas conditions are present which favour atelectasis. The details of the four fatal instances in which the paper is based certainly give support to this theory. Jones and Burford recommend the routine use of helium during the administration of cyclopropane and describe the most convenient method of carrying this out. But, as we have already had occasion to point out,[3] helium is more readily obtainable for this purpose in America than here.

[1] *Lancet*, March 12th, pp. 613 and 619.
[2] *J. Amer. med. Ass.* April 2nd, p. 1092.

STUDIES ON TYPHOID FEVER ON THE WITWATERSRAND

IN a monograph issued from the South African Institute for Medical Research, Dr. W. Lewin[4] records a series of observations on the diagnosis, prophylaxis, and serum treatment of typhoid fever. He confirms the findings of A. Felix, and of many subsequent workers, in regard to the part played by the Vi antigen in determining mouse-virulence and immunising potency; and he notes, again in agreement with many other observers, that a vaccine prepared from a strain containing the Vi antigen will induce an active immunity in mice, even though the treatment employed in killing the bacilli has deprived them of the power of stimulating the production of Vi agglutinin in detectable amounts.

In a study of 229 strains of *Bact. typhosum* freshly isolated from cases of enteric fever, he finds, as others have done, that the great majority of such strains are of the form which Kauffmann has named V-W. These strains contain the Vi antigen, but not in so large an amount as to render the bacilli inagglutinable by an O antiserum in moderate dilution. Strains of Kauffmann's V type, in which the preponderance of Vi antigen inhibits agglutination in an O antiserum are relatively rare (18 of 229 strains), and strains of Kauffmann's W type, in which the Vi antigen is absent, or undetectable by direct agglutination, are rarer still (4 of 229 strains). No correlation could be observed between the severity of the disease and the type of infecting bacillus. The proportions of the different types in a small series of strains isolated from carriers were found to be very similar. It is noted that repeated examinations of a single carrier at considerable intervals of time may yield strains of all three types.

The sections on diagnosis deal in the main with an attempt to establish a "diagnostic titre" for H and O agglutinins, using standardised bacterial suspensions. Taking the obvious point of departure, though its obviousness has not always led to its adoption, the author first determined the frequency of agglutination at various titres among 442 samples of serum obtained from normal persons in the district concerned who gave no history of an attack of enteric fever, or of antityphoid inoculation. He found that 2·9 per cent. of these normal sera gave H agglutination at a titre of 1 : 100, while 2·0 per cent. gave O agglutination at 1 : 200. He adopted these titres for his diagnostic tests because (*a*) at this level the odds would be high against a false positive result, and (*b*) because most patients suffering from typhoid fever form agglutinin to titres as high or higher than these, so that there should not be many false negative results. Two series of cases are described in which this method was put to the test. Both series were observed in hospital. In the first series only one specimen of serum was examined from each patient. In 32 cases a provisional diagnosis of enteric fever on admission was confirmed by the isolation of *Bact. typhosum* from the blood or excreta. In 81 per

[3] *Lancet*, April 30th, p. 1008.
[4] Typhoid Fever on the Witwatersrand: Bacteriological Aspects, Serological Diagnosis, Specific Prophylaxis, and Specific Treatment. *Publ. S. Afr. Inst. med. Res.* 1938, **8**, 413–550.

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cent. of these cases the agglutination reaction was recorded as positive. In 19 cases a provisional diagnosis of typhoid was confirmed on clinical grounds, but *Bact. typhosum* was not isolated. In 89 per cent. of these cases the agglutination test was positive. In 62 cases a provisional diagnosis of typhoid was not confirmed after observation in hospital. In 95 per cent. of these cases the agglutination test was negative. In a second series of cases, in which repeated tests were made on each patient, all of 34 cases from which *Bact. typhosum* was isolated and all of 15 cases of "clinically confirmed" typhoid, gave a positive agglutination test at some stage of the attack, while of 57 cases in which a provisional diagnosis of typhoid was rejected on clinical grounds, 96 per cent. gave only negative reactions.

The sections on prophylaxis deal mainly with a comparison between the results produced by subcutaneous inoculation of a vaccine ("typhoid endotoxoid") prepared by Grasset by the formolisation of frozen and thawed bacterial suspensions, and the administration of typhoid vaccine in large doses by mouth, as advocated by Besredka. The "typhoid endotoxin," like other bacterial vaccines, induces the formation of H and O agglutinins, but not of Vi agglutinins. The author's results with vaccination by mouth are in entire agreement with those of many workers who have reported a poor, or negligible, agglutinin response, following this procedure. The accounts of field trials suffer from the fact that in no case is it possible to compare the incidence of the disease in inoculated and control groups exposed to the same environment over the same period of time; but, so far as can be judged from a decreased attack-rate on a particular mine following mass immunisation, or comparisons between one mine and another, there is a strong suggestion that subcutaneous inoculation has a high protective value, while the administration of vaccine by mouth has very little.

In regard to serum therapy, a description is given of 62 serum-treated cases and 625 controls. In non-European patients the cases treated with serum showed a case-mortality of 23·8 per cent. as compared with 32·2 per cent. among the controls, while for European patients the corresponding figures were 7·3 per cent. as compared with 18·9 per cent. The serum employed in this series of tests contained no Vi antibody. A small series of more recent cases have been treated with a serum containing this antibody, with encouraging results; but no statistical assessment is yet possible. In a final section, a description is given of a small series of cases treated with increasing doses of a "typhoid endotoxoid" vaccine, apparently with beneficial results.

TESTOSTERONE IN GRAVES'S DISEASE

THE anterior lobe of the pituitary gland secretes a hormone that stimulates the thyroid. If Graves's disease is caused by excessive secretion of this thyrotropic hormone it might rationally be treated with hormones known to inhibit anterior-pituitary function.[1] On this basis Spence[2] in 1935 and 1936 gave œstrin to six women with toxic goitre, for periods up to three weeks; but it did them little or no good. In our correspondence columns this week Dr. Loeser records a similar attempt, using testosterone propionate instead of œstrin, and it will be seen that he is favourably impressed. His "first success" has however been anticipated; for Dr. Levy Simpson[3] has just recorded three other cases similarly treated, one of them since last October. All three patients felt and seemed the better for their treatment, and they took no harm from it. One of them had a toxic adenoma, and showed improvement in the electrocardiogram though not much otherwise. The other two, with Graves's disease, each gained about a stone within three weeks, and Simpson thinks it possible that "started early, or continued for a long period, testosterone propionate might prove to have a fundamental influence on the course of exophthalmic goitre." He adds, however, that the "anabolic" effect may be non-specific and partly due to water-retention.

[1] See *Lancet*, 1936, 2, 990.
[2] Spence, A. W., *Ibid*, p. 970.
[3] Simpson, S. L., *Postgrad. med. J.* May, 1938, p. 144.

HOSPITAL REPORTS

THE scientific as opposed to administrative reports which an increasing number of London and provincial hospitals now publish annually or at more frequent intervals are of distinct types. The well-known *Guy's Hospital Reports*, for instance, published quarterly, contain only records of research in progress at the hospital which have not appeared elsewhere, whereas at the other extreme the *Collected Papers of the Middlesex Hospital Medical School* is a volume of bound reprints from a variety of journals. The former type of issue, quite apart from its traditional importance in a hospital in which it has long been established, provides a convenient medium for the publication of papers which have a peculiar interest for its alumni, or are unsuitable because of their length or other reasons for the general or special medical journals. The latter brings together the papers published by the hospital staff during the year and shows how diverse is its contribution to research. Probably too it has considerable value in stimulating gifts to the hospital and in gratifying those who have already helped it. Between these are intermediate types. Thus the current number of the *Brompton Hospital Reports* contains three original papers dealing with work done at the hospital and sixteen which have already been published. The republished papers are not mere reprints, however, but have been reset so that the lay-out of the pages is uniform. In the *St. Thomas's Hospital Reports* for 1937 the main mass of the book is taken up with original papers, but at the end there are abstracts of those published by the staff in other journals during the year. Hospitals under local authorities also enter the field. The London County Council reprint annually in the *Archives of Neurology and Pathology* the writings of its staff at the Central Pathological Laboratory at the Maudsley Hospital, and moreover a considerable body of original matter, of general or special medical interest, appears in the various sections of the annual reports of the Council.

Much might be said on the general issue of the choice of "a local habitation" for an account of original work of such merit that it would be not only acceptable but welcome almost anywhere. We commented a few months ago on the quality of the articles in the current *St. Bartholomew's Hospital Reports* and on the small number of subscribers to that journal. Some would say that work printed in a hospital journal remains more or less in hiding; others would protest that only by forcing old students and others to turn to the pages of their hospital reports will the institution receive due recognition and perhaps financial support as the place which provided the facilities for the work done. This may apply particularly to smaller hospitals; the *Royal Berkshire Hospital Reports*, of which the fourth number has just appeared, contains original work of considerable

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merit, and it is said rather surprisingly to be intended primarily for circulation to the hospitals' subscribers. Probably the question will decide itself. Few hospitals are likely to follow the example of Guy's and undertake to issue reports quarterly, in which case the staff will perforce publish most of their work outside, though yielding with various degrees of grace to the appeals of the editors for occasional contributions.

EXPERIMENTAL PEPTIC ULCER

PEPTIC ulcer ranks with rheumatism and cancer as one of the common diseases whose causes are still obscure. It looks as if it ought to be a less difficult problem to solve than either of the other two. It is such a consistent well-defined lesion, and we seem able to modify its course considerably by treatment. Yet no infection has been found to account for it and it cannot be attributed to any precise dietetic deficiency. The psychologists would persuade us that emotional disturbances underlie it; but though these are evidently an important factor in the ulcer patient we hesitate to accept them as the whole cause of the disorder. Whatever rôle we assign to constitution or diathesis, we cannot regard that as anything more than a predisposing factor. Yet we feel that a clearer understanding of the causes and even of the pathological mechanism of the chronic ulcer would quickly lead us to means of preventing it.

Some light on the mechanism may yet come from the study of experimental chronic ulcer in animals. This may now be produced in dogs in two ways. The well-known Mann-Williamson procedure is a violent anatomical rearrangement of the gastro-intestinal tract: the pylorus is divided and the upper end of the duodenum closed; the duodeno-jejunal junction is divided and the lower end of the duodenum inserted into the lower ileum, while the pyloric end of the stomach is anastomosed to the upper end of the jejunum. The duodenal juices are thus delivered uselessly into the lower ileum and the animal wastes from interference with intestinal digestion; but in the meantime it almost always develops an ulcer in the uppermost jejunum, just where the acid gastric contents first impinge on jejunal mucosa. A recent study [1] on Mann-Williamson dogs started from the suggestion that gastric ulcer seems to be less common in pregnant women than in the non-pregnant. The pregnancy hormones were therefore given to groups of animals for the weeks following operation. Twelve control dogs all developed ulcers, and fifteen which received 1000 units daily of theelin (œstrin) did likewise; but of fifteen which were given 100 units daily of Antuitrin S, eight developed no ulcers at all and the rest were less severely ulcerated than the controls. Antuitrin S is the "pituitary-like" hormone of pregnancy urine, and any theoretical connexion between it and the jejunal mucosa is at present too remote to be worth looking for. But the experimental results are striking and the observation is obviously worth repeating and following up.

The second variety of experimental ulcer is produced with great regularity in dogs by oral or parenteral administration of cinchophen in doses only a little larger than those commonly advocated in human therapeutics.[2] With the first few daily doses of the drug a diffuse hæmorrhagic gastritis develops, and the dog vomits, passes tarry stools, and loses its appetite. The stomach mucosa shows œdema, congestion and round-cell infiltration, multiple erosions, and small acute ulcers. At the same time the amount of acid juice which it secretes is much increased, though the concentration of acid shows little change. In a week or two this phase subsides, the secretion diminishes, and the mucosal changes regress, leaving, however, one or two ulcers which persist and become chronic. These are almost always situated on the lesser curve near the pylorus, and histologically they closely resemble human peptic ulcers. They may perforate or bleed severely. They last as long as the cinchophen administration is continued and then heal in about three weeks in those dogs that survive. In batches of dogs the number that develop cinchophen ulcers and the severity of the initial gastritic changes can be somewhat diminished by a milk diet, and by large doses of mucin; milk diet with alkali administration prevents the formation of chronic ulcers altogether, but only mitigates the acute changes, and a preliminary gastro-jejunostomy has much the same effect; but animals given histidine hydrochloride develops ulcers with the same regularity and severity as controls. Ulcer does not occur in the antrum when it is surgically isolated from the rest of the stomach and thereby protected from contact with acid gastric secretion. There is thus a remarkable parallelism in behaviour and in structure between cinchophen ulcer in the dog and human peptic ulcer. This is not to say that the human ulcer is caused either by cinchophen or by any other simple chemical poison, but it suggests a state of normal balance between the digestive attack of acid gastric juice and the defences of the gastric mucosa—a balance that is upset in the dog by a poison which damages the defences and incidentally strengthens the attack. If the investigators can go on to discover how it damages the mucous membrane cells, or what is the intimate biochemistry of its action, they may provide clues to the major problem of the genesis of human peptic ulcer.

[1] Sandweiss, D. J., Saltzstein, H. C., and Farbman, A., *Amer. J. dig. Dis. Nut.* 1938, 5, 24.
[2] Bollman, J. L., Stalker, L. K., and Mann, F. C., *Arch. intern. Med.* January, 1938, p. 119; *Arch. Surg., Chicago*, 1937, 34, 1172, and 1937, 35, 290; *Amer. J. dig. Dis. Nut.* 1937, 3, 822.

EVACUATION OF CHILDREN FROM THREATENED TOWNS

IN a moving plea for plans to ensure the removal of children from the great cities most exposed to aerial attack upon this country, Prof. J. A. Ryle in the *Times* of May 9th offers new constructive suggestions. In his view

the most appropriate and feasible scheme, if the emergency threatens, would be one devised to secure adoption of city boroughs, districts, and streets by counties, small country townships, and villages. For the planning of evacuation coöperation and conference between the education authorities in town and country, existing organizations such as the Children's Country Holiday Fund and the railway companies at once suggest themselves. With schools as collecting and receiving stations, one teacher allotted to every 50 children and one boy scout or girl guide to every 10, marshalling and control in transit should be possible and effective. Arrangements for reception and redistribution to mansion or school or farm or cottage would be the concern of committees in the small towns and villages. Rationing depôts would have to be established in or near the county towns. Each child should have an indestructible label with name and address and registration number and a linen bag containing a mug and a spoon, an iron ration, and, where possible, a change of underclothes. Children of one family should, so far as possible, be kept together—an elementary but important lesson from experience with the

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Basque children. The first evacuations should be of children between the ages of five and fifteen. Mothers with smaller children and infants would require a separate organization, but when moved should at least be conveyed to the same county as other members of their families.

The need for careful local investigation and central record of the billeting possibilities in the country districts and of attention to the organisation of transport, commissariat, hygiene, and medical services is not ignored. Prof. Ryle evidently has reason to believe that peace organisations and such bodies as the Society of Friends could be relied on to help in these matters; and he points out that such voluntary participation would not only relieve the Government of a heavy responsibility, but would perhaps be more acceptable to parents than any alternative plan. The arguments for and against closing London schools during the period for which air raids might be expected are well set out in the report made this week to the L.C.C. by its education committee, who give their reasons for favouring a policy of (*a*) evacuation of children to safer districts, and (*b*) immediate closure of all schools on the occurrence of an emergency.

The fact that 4000 Basque children could be brought to this country at short notice and distributed about our countryside encourages the idea that on the principle of adoption might be based a scheme whereby, in a national crisis, our own children could be removed from the dangers of physical injury and the even greater danger of lasting mental trauma.

NURSING CONDITIONS IN L.C.C. HOSPITALS

WHILE other authorities, municipal and voluntary, are busy with shortening the hours of their nursing staffs and increasing the amenities offered to them, the L.C.C. intends on the recommendation of its Hospital and Medical Services Committee to make alterations so far-reaching as to change the whole pattern of the nursing service. A 96-hour fortnight for both day and night duty is to be worked on a three-shift basis with an overlap of shifts in the middle of the day and in the afternoons while lectures and classes are being held. In the general hospitals members of the emergency staff already allocated to each hospital are to supplement the ward staff during the peak hours from 7.30 A.M. to 11 A.M. During normal conditions the hours at fever hospitals will fall into line; for times of epidemic no recommendation is made at the moment. The carrying out of these proposals will involve the employment of about 1000 additional staff at an ultimate cost estimated at nearly £123,000 a year; and nurses experienced in hospital administration are likely to agree that the additional staff required for efficient service will exceed expectations.

If the announcement gives a shock to ratepayers, it may cause even more disturbance to the authorities of voluntary hospitals who are competitors for recruits to a nursing cadre. Those training schools whose prestige rests firmly on a tradition of excellent teaching facilities and of consideration for their staff have little to fear; they will find young women prepared to offer more arduous effort for the privilege of enrolment in their service. But they will be wise not to disregard the other changes contemplated by the L.C.C. in the direction of greater freedom, especially to State-registered nurses. These proposals include, besides liberty to return to hospital at a later hour without having to seek previous permission (State-registered nurses will not be bound even by a midnight curfew), many privileges that will give satisfaction without being very costly. Some of these, such as provision of a special room for games, theatricals, or dressmaking, of weekly periodicals in staff common-rooms and arrangements for enabling nurses to have breakfast or supper in bed on days or evenings off, are already offered by many voluntary hospitals. Facilities for the supply of light refreshments after 10 P.M. for those nurses who have been absent from supper are more rare. A new and a good idea is the provision of accommodation at other hospitals of the Council for nurses who want to spend their free nights in a different atmosphere, and of picnic meals for others who propose to make expeditions to the country on their free days. Those who have long advocated a readjustment of conditions of hospital service to meet the changed outlook of the modern girl will welcome all these amenities and the reduction of hours of work. The ultimate effect of the adoption of the three-shift basis of service is less certain. THE LANCET Commission on Nursing recorded the success of this experiment in New Zealand and elsewhere abroad and in some hospitals at home, but did not anticipate its general adoption here "at any rate for some time." Their survey was indeed deliberately restricted to a search for desirable adjustments without fundamental change in the present system of hospital staffing. But they noted the main advantage of the three-shift system: it obviates the need for complicated schedules of off-duty time and shortens the span of work, since the nurse's eight hours on duty are consecutive, broken only by meals. The fact that the application of this system to domiciliary nursing would gravely disturb the conditions of employment of private nurses is no argument against its trial in institutions where the shortage of recruits has now become so acute that drastic changes of policy are inevitable.

EXCLUDING TUBERCLE FROM THE SERVICES

THE remarkable extent to which the radiological examination of the chest has come to be considered essential in any scheme for testing the fitness of applicants for public service is indicated by a study in the *Revue de la Tuberculose* for March by A. Bidermann and A. Alibert. The French law of March 30th, 1929, made obligatory the examination by a specialist in tuberculosis of every applicant for an administrative appointment under the State. No applicant could be accepted unless he were found to be free from tuberculosis by a clinical and radioscopic examination supplemented, if necessary, by a radiographic examination. Since 1933 the radioscopic examination of the chest has been systematically practised in the French army and in many other services. Bidermann and Alibert have studied three important services, those of the railways, police, and State. Their conditions are in some respects dissimilar, the health standards required of the police being particularly high. Of the 24,827 candidates for employment by the railways during the three-year period 1935–37 297, or 1·2 per cent., were discarded on radiological evidence. This comparatively low ratio reflects the fact that the persons radiologically examined had all been passed as sound after a clinical examination which, when it had revealed definite evidence of pulmonary tuberculosis, had rendered a radiological examination superfluous. Another qualifying fact to be noted is that the radiologists did not discard those applicants whose radiological shadows could be interpreted as harmless though possibly tuberculous. The radiological examination of 2066

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would-be policemen led to the discarding of only 19, or 0·9 per cent. But of this group it must be said that they were hand-picked beforehand, having served in the army and having been examined by the chief medical officer of the prefecture. The third category represented less select material, the applicants for administrative employment by the State belonging to both sexes and, in most cases, not having undergone a general medical examination beforehand. Several of the men had not undergone military service. Of the 1891 applicants radiologically examined 30, or 1·6 per cent., were discarded on the radiological report. Since the institution of routine examination of applicants for these various services there has been a great decline in the percentage of discards: in the case of the police from 1·8 per cent. in 1933–34 to 0·5 per cent. in 1936–37. This decline is to a certain extent the measure of the popularity of the radiological examination which weeds out more and more radiologically positive persons before ever they come to the final examination for service. Only a few years ago persons conscious of a tuberculous past would take the chance of its being undetected by the medical examiner, whereas at the present time the prospect of a radiological examination deters many a gambler from such a chance. The State employee who develops tuberculosis is now given sickness benefit on a generous scale, and the State is naturally anxious to avoid many such calls; what it spends on radiological examinations by experts is a trifle compared with what it saves by the timely elimination of tuberculous applicants.

BACTERICIDE WITHIN THE BODY

IT is only six years since the synthesis of Prontosil and only three since its remarkable antibacterial properties were first disclosed. Since then the stream of chronicles, critical or merely descriptive, of the successful use of this drug and of its derivative sulphanilamide has swelled to a river so full and so fast that none but an expert could plunge his way through it and survive to comment sanely on his experience. The definite knowledge accumulated about this group of drugs has been masked by publications which are either speculative, statistically vulnerable, or so irrelevant as to merit little attention. The fact that most of the early work on the subject in this country appeared in our columns makes them an appropriate place for an assessment and we therefore invited Prof. Garrod to undertake this arduous task. He introduces his masterly survey (see p. 1125) of the results of this method of treatment by tracing its development and considering its mechanism. He discusses absorption, circulation and excretion, choice of compound and dosage, and begins a review of therapeutic action which this week is confined to the various streptococcal infections. In a concluding article next week he will discuss the effect of this group of drugs on infections due to certain other organisms, their use in prophylaxis, their local application under certain conditions, and their toxic effects.

The section to which we would direct special attention in the first part of this survey is that on mode of action. Prof. Garrod shows that this is no longer "an astonishingly efficient mystery" though it is not yet completely cleared up. And he emphasises again a point which though often made is not always taken: that the use of these drugs, which is not without its dangers, imperatively demands a bacteriological as well as a clinical diagnosis. They are specific not for septicæmia, meningitis, or pneumonia but for infections by certain bacteria wherever situated, while on other species they have little or no effect.

MARRIAGE GUIDANCE CLINIC

A MEETING will be held at the Caxton Hall, Westminster, on Thursday, May 19th, at 5.30 P.M., to discuss the tentative programme put forward by the committee which has been formed under this name to carry on the work of the marriage committee of the British Social Hygiene Council. It is proposed that the new committee should be controlled by an independent governing body drawn from among medical, scientific, educational, social, and religious workers. Its aims are to give preparation for marriage through lectures and private consultations, and to build up gradually a body of people qualified to deal with problems in marital relationships. If the work of this voluntary committee is proved to fill a need it is hoped it will ultimately be recognised as a necessary part of national schemes of preventive medicine. The chairman of the provisional committee which has been appointed is the Rev. A. Herbert Gray, and the vice-chairman is Mrs. L. Blackett Jeffries, M.D. Among the medical names on the advisory board are Lady Barrett, Dr. Gladys Cox, Dr. Ethel Dukes, Dr. Frances Huxley, Dr. Joan Malleson, Dr. Emanuel Miller, Dr. J. R. Rees, and Dr. Henry L. Wilson. Further information may be had from the secretary, Mrs. M. C. Hume, 13, Wildwood-road, London, N.W.11.

THE next session of the General Medical Council will open on Tuesday, May 24th, at 2 P.M., when Sir Norman Walker, the president, will deliver an address.

A NUMBER of subjects bearing on medical research are to be considered by the section of chemistry at the British Association's meeting at Cambridge in August. In a discussion on repercussions of synthetic organic chemistry on biology and medicine Prof. E. C. Dodds and Prof. L. Ruzicka (Zürich) will describe work on the production of new compounds having the biological action of the sex hormones, and Mr. A. S. Parkes, F.R.S., will deal with some of their interesting biological interrelationships. The programme will also include descriptions of synthetic compounds that are able to produce cancer (Prof. J. W. Cook, F.R.S.), of new compounds having the physiological action of the life-maintenance hormone of the adrenal cortex (Prof. T. Reichstein, Zürich), and of the synthesis of vitamin B_1 and analogous compounds (Mr. A. R. Todd, Ph.D.).

EDUCATION IN THE OPEN AIR.—Speaking last Saturday at the opening of the Hayling Island Open-air School established at the sea-side by the Tottenham local education authority, Mr. Kenneth Lindsay, parliamentary secretary to the Board of Education, said that the number of open-air schools had increased from 7 in 1910 to 153 to-day, with accommodation for something over 16,000 children, and 33,500 children had passed through them last year. The open-air school was not merely a school in the open air; it comprised a way of life and a system both of educational and medical supervision, characterised by fresh air and sunlight, a proper and sufficient diet, healthful and adequate rest, a hygienic way of life, from regular bathing to participation in formal physical training, medical treatment, individual attention, and special educational methods.

The Tottenham authority have provided the new premises, at a cost of some £30,000, and the school accommodates 120 children, half of whom are sent by other authorities.

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SPECIAL ARTICLES

THE CHEMOTHERAPY OF BACTERIAL INFECTIONS

By Lawrence P. Garrod, M.D., F.R.C.P.

BACTERIOLOGIST TO ST. BARTHOLOMEW'S HOSPITAL; PROFESSOR OF BACTERIOLOGY IN THE UNIVERSITY OF LONDON

It has long been believed that bacterial infections differ from protozoal in being by nature insusceptible to chemotherapy. Apart from the action of Novarsenobenzol in anthrax, and the clinically inapplicable treatment of experimental pneumococcal infection with Optochin, the only site in which bacteria have been found vulnerable by systemic chemical attack is the urinary tract, and here conditions are peculiar. This situation has been radically altered by the discovery of Prontosil and the studies which have ensued from it. The known effective scope of treatment with this and allied compounds is widening rapidly, and while in several directions most brilliant success has already been achieved, so much ground remains to be explored that the ultimate consequences of this discovery are beyond prediction. It is the purpose of the following review to assemble information on this subject, which exists for the most part only in scattered form, and particularly to assess the value of the treatment in each of those diseases in which it has been tried. The literature of the subject is already so extensive that few are in a position to assimilate it except in predigested form.

It is necessary to a proper understanding of this treatment first to trace its development and to consider its mechanism.

Discovery of Prontosil

It is only just to acknowledge that the credit for what is perhaps the greatest discovery in modern therapeutics belongs entirely to the staff of the institute of experimental pathology and bacteriology of the I. G. Farbenindustrie, Elberfeld. Others have contributed largely to its extension; workers in France provided the clue to the secondary discovery of the action of sulphanilamide, and valuable studies both of the action and of the mode of action of these drugs have been carried out here and in the U.S.A., but it was the original German discovery that pointed the way to these efforts. Sulphamido-chrysoidin (prontosil) was synthesised by Mietzsch and Klarer in 1932, and its properties were first generally disclosed by Domagk [39] in 1935. During this long interval it had evidently been placed in the hands of practitioners in the Rhineland for clinical trial, and early reports such as those of Foerster [51] and Grütz [66] might have indicated to anyone with a careful eye on the German literature that something new was brewing, The facts revealed by Domagk, and subsequently by Hörlein [82] in the English medical press, were these. Prontosil was one of a number of azo compounds which had been tested for antistreptococcal activity in mice in the course of a prolonged research previously embracing organic compounds of gold. It was almost non-toxic, and pharmacologically inert in the sense that blood pressure, unstriped muscle, and the integrity of blood-vessels were unaffected by it, but mice inoculated intraperitoneally with 10 minimum lethal doses of *Streptococcus pyogenes* survived if from 1/10 to 1/50 of the maximum tolerated dose were administered repeatedly either orally or by injection. Staphylococci were also susceptible to its action: pneumococci and other species of streptococci than *S. pyogenes* were not. This action in mice had been confirmed in man by dramatic results in the treatment of streptococcal infections; Domagk's original paper is immediately succeeded by two others describing such results.

These experimental observations were confirmed by Levaditi and Vaisman [96 97 99] and by Nitti and Bovet [123] in France and by Buttle * and by Colebrook and Kenny [30] in this country, after a short period of doubt attributable to the use of different strains of streptococci. It soon became evident that the most striking results were obtainable with streptococci of high mouse virulence, and this apparent anomaly depended on the fact that a minimum lethal dose contained only a small number of cocci; it is a peculiarity of prontosil, evidenced in other ways, that it acts best on a sparse and scattered bacterial population, and not on highly concentrated masses of bacteria.

SULPHANILAMIDE

Prontosil is entirely without action on bacteria in vitro, and its mode of action in the body was an almost complete mystery until Tréfouël, Tréfouël, Nitti, and Bovet [158 159] put forward the hypothesis which launched an immense volume of effort in a new direction. Arguing by analogy with a much earlier observation by Heidelberger, and by comparison between therapeutic activity and the constitution of a number of different azo compounds, they concluded that activity resided in that part of the molecule which consisted of a sulphonamide group attached to one benzene nucleus. Assuming that sulphamido-chrysoidin (prontosil) in the body is split at the double bond, but without proving that this is so (a task later carried out by others), they proceeded to test the therapeutic action of one component which would thus be liberated, and found it equivalent to that of prontosil itself. Thus began the study of *p*-aminobenzene sulphonamide (first abbreviated to "sulphonamide" but now known as "sulphanilamide"). This compound is not only therapeutically effective, but it has an action on streptococci and other bacteria which is demonstrable in vitro. It remained for Fuller [56] to prove that sulphanilamide is formed in the body when prontosil is administered; this he did by studying the urinary excretion of the drug in mice. In the normal animal only about one-quarter of the prontosil given appears in the urine as sulphanilamide, in the infected animal nearly one-half; excretion is also slower in the presence of infection. These differences remain unexplained, but it may be pertinent to them that Long and Bliss [105] claim to have demonstrated a reducing action on prontosil exerted by streptococci themselves.

This further very promising discovery, coupled with the fact that sulphanilamide was not protected by patents, led rapidly to its widespread manufacture and use, particularly in this country and the U.S.A.

Composition and Nomenclature

Sulphanilamide is marketed under a number of proprietary names, some of which afford a clue to its identity, while others appear quite meaningless. It is to be hoped that manufacturers gain some advantage from this practice commensurate with the confusion which it causes. This multiplicity of

* See *Lancet*, 1935, 2, 840.

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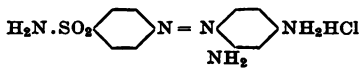
names, together with the advent of further new compounds chemically related to sulphanilamide, make it necessary to define the substances with which we are dealing. An account of wider efforts to synthesise new compounds will be given later; the following are those which have been used in therapeutics :—

Prontosil (originally known as Streptozon; subsequently as Prontosil rubrum, Prontosil flavum, or Prontosil):

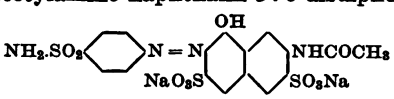
4'-sulphamido-2 : 4-diaminoazobenzene hydrochloride.



Given by mouth only; the preparation with which many early studies were done, but now much less often used.

Soluble prontosil (Prontosil solubile: marketed by one firm in U.S.A. as Prontosil).

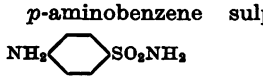
The disodium salt of 4' sulphonamide-phenyl-azo-1-oxy-7-acetylamino-naphthalin-3 : 6-disulphurous acid



Given by intramuscular injection. (It is to be understood that when "prontosil" is said in this paper to have been given by any parenteral route, this form of the drug is meant.)

Rubiazol, the French equivalent of prontosil, which owes its manufacture in France to the exemption of medicaments from patent law in that country, had originally the same composition [99] as the German product, but the name now denotes a compound with an added COOH group.[141]

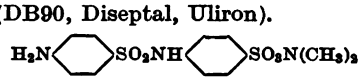
Sulphanilamide: *p*-aminobenzene sulphonamide



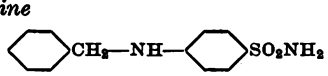
(marketed as Sulphanilamide, Prontosil album, Sulphonamide-P, Streptocide, Prontylin, Colsulanyde, Sulphamidyl, &c.). Given by mouth, by subcutaneous injection, and intrathecally.

The three other compounds for which therapeutic data are available are :—

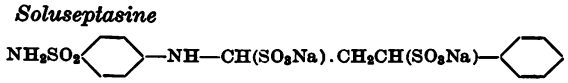
Uleron (DB90, Diseptal, Uliron).



Proseptasine



Soluseptasine



It is to be noted that most of what follows does not necessarily apply to any of these substances; what is known of their properties will be mentioned separately.

Absorption, Circulation, and Excretion

The only full pharmacological study hitherto published is the valuable work of Marshall, Emerson, and Cutting [106 107 108] and concerns sulphanilamide only. These authors have shown by repeated estimations of the drug in the blood that it is rapidly absorbed from the gastro-intestinal tract, this process being complete within 4 hours, and that it enters the circulation at the same rate if given subcutaneously. Reaching a peak in about 3 hours, the concentration falls in a straight line to almost zero in 24 hours; this means that a fully adequate amount for therapeutic action persists after any single dose for about 6 hours; 4 or 6 hourly administration will therefore maintain this. This persistence in the blood is clearly an important factor in success; other substances theoretically capable of chemotherapeutic action, such as acridine compounds, are so rapidly eliminated that an adequate blood level is not maintained. Marshall and his colleagues claim to have shown that this persistence in the blood is due to the reabsorption in the renal tubules of 70–80 per cent. of the sulphanilamide in the glomerular filtrate. In the same experiments the rate of clearance was found to be independent of the plasma level, but to increase with the rate of urine flow; (the knowledge that the drug can be washed out of the circulation by forced fluids and consequent diuresis may be utilised in over-dosage accompanied by toxic effects). These workers also estimated the drug in various organs, and found the concentration everywhere the same but for a diminished amount in bone and fat; it appears that sulphanilamide is uniformly distributed in the water of the body. They demonstrated its presence in pleural and peritoneal effusions, saliva, pancreatic juice, and in the cerebro-spinal fluid. In this last and most important situation serial estimations in the dog, in a normal man, and in a patient convalescent from cerebro-spinal fever all gave similar results; the curve of concentration paralleled that in the blood at about three-quarters of the blood level. These findings differ from those of Jauerneck and Gueffroy,[86] according to whom excretion into the cerebro-spinal fluid may be delayed, more so in the normal individual than in the presence of meningitis. This discrepancy calls for further study; frequent comparisons of the blood and C.S.F. concentrations during treatment for meningitis are desirable.

Sulphanilamide is wholly excreted in the urine, where it appears in both free and conjugated form. Excretion is delayed when the kidneys are previously damaged. It has already been mentioned that prontosil is excreted in the urine partly unchanged and part as sulphanilamide. The general behaviour of all these compounds in the body is probably similar, but studies such as those described have not been published in connexion with any compound other than sulphanilamide.

Choice of Compound and Dosage

It will save repetition to summarise the general results of clinical experience on these points. With exceptions, which will be noted later, sulphanilamide receives an overwhelming vote as the most generally useful drug, and oral administration, when feasible, serves all purposes except perhaps the immediate treatment of meningitis, when intrathecal injection of a 0·8 per cent. solution in saline may be desirable. This solution may also be given subcutaneously, if necessary in large volumes (700 c.cm. has so been given as an initial dose) when swallowing or alimentary absorption is at fault. An alternative in these circumstances is to inject prontosil soluble intramuscularly (intravenous injection of this compound is unnecessary and badly tolerated and intrathecal is dangerous). Most authors agree that a large initial dose is desirable (of sulphanilamide from 3 to 5 g.) in order to attain an adequate blood level as soon as possible; Long and Bliss [105] suggest an estimation of the blood content four hours later; if this should be below 10 mg. per 100 c.cm. subcutaneous injection is indicated. Further doses should be given 4-hourly. Long and Bliss in this and another paper [102] discuss dosage fully, and adopt

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the rule for total daily dosage of 1 g. sulphanilamide per 20 lb. of body-weight (maximum 5 g.) and 1 c.cm. prontosil soluble (2·5 per cent. solution) per 1 lb. (maximum 120 c.cm.). These doses, especially of sulphanilamide, have often been exceeded, though a dose of over 7 g. daily is uncommon. Children require a 50 per cent. larger dose in proportion to body-weight than adults.[103] These maximum doses should be stepped down at two- or three-day intervals in favourable cases.

This scheme applies to gravely ill patients; for less serious cases half this dosage or less may be enough. Opinion on the advisable duration of the treatment has not yet crystallised, but there is much to be said for limiting a course to ten days, and only resuming it, if necessary, after an interval. What these drugs can do they usually will do within that time or less, and fatal agranulocytosis is a possible consequence of prolonged administration.

Mode of Action

The intelligent use of any drug demands that its mode of action shall if possible be understood, since special circumstances may arise in which such knowledge alone can dictate the right course to adopt.

It is perhaps scarcely necessary to point out that the use of these drugs imperatively demands a bacteriological as well as a clinical diagnosis. They are specifics not for septicæmia, meningitis, or pneumonia, but for infections by certain bacteria wherever situated, while on other species they have little or no effect. They interfere in some way with the activities of these bacteria in the body, and the question is, how?

Some of the most successful forms of chemotherapy are imperfectly understood, and for a time after Domagk's original announcement prontosil was simply accepted as an astonishingly efficient mystery. How it was first postulated and then proved that prontosil liberates in the body the substance now known as sulphanilamide, which has a demonstrable effect on bacteria, has already been related. Two other experiments may here be mentioned which bear on this point; whereas prontosil has no effect on streptococci in vitro, it was reduced with the aid of magnesium powder by Colebrook, Buttle, and O'Meara[29] and with cysteine hydrochloride by Bliss and Long[9] to something, presumably sulphanilamide, which was bacteriostatic. The former authors also describe the first detailed experiments illustrating the effect of sulphanilamide on streptococci in vitro. A concentration of no more than 1 part in 18,000 (i.e., less than that attainable in the blood) prevented the growth of *small numbers* of streptococci (a few hundreds or perhaps thousands per c.cm., but not the millions introduced by an inoculum of undiluted culture). This action was most marked in blood, and much more so in human or monkey blood than in that of the rabbit or mouse; it was also obtained in serum, and to a less extent in broth. Among other authors[104 124] who have confirmed these observations, only Hoare[80] has amplified them significantly. He finds that the blood of patients taking prontosil or sulphanilamide is actually bactericidal to streptococci; that this effect is not the so-called Tillett phenomenon[156] is evidenced by similar effects obtained with normal blood and equivalent added sulphanilamide. The blood may assume this property within 1 hour of administration or only after some delay; this difference is attributable to variation in the rate of absorption.[81] Of 21 strains of *S. pyogenes* tested in normal blood with added sulphanilamide, all but 2 were destroyed, and these came from cases which had not responded to sulphanilamide treatment (it is noteworthy in this connexion that a similar relationship between resistance in vivo and in vitro has been observed by Bliss and Long[11] among serological groups of *S. pyogenes* and by Felke[49] among different strains of gonococci). Substitution experiments showed that no change in the leucocytes of treated patients was responsible; the active agent was in the serum. Sulphanilamide was also bactericidal in serum alone, but this effect required doubled concentrations (optimum 1 in 8000, that in blood being 1 in 16,000, with lesser effects in each case up to one-eighth of these).

These are formidable facts, and strongly support the simplest explanation of the whole problem—namely, that sulphanilamide has a direct damaging action on streptococci, either actually killing them, or at least preventing their growth; the limited numbers upon which the drug acts in vitro correspond to those found in the blood-stream and elsewhere in widespread infection. Bacteriostasis, which if complete must ultimately result in the victory of the bodily defence mechanism, is the explanation accepted by Bliss and Long[10] and by Gay and Clark.[58] The latters' work and that of Mellon et al[115] indicates that there is no stimulation of the defence mechanism, in the sense of any altered behaviour on the part of leucocytes.

This general view, although widely accepted here and in the United States, has been strongly contested on the Continent. Its principal opponent is Domagk[40 41 42] himself, who is unwilling to relinquish the idea that prontosil has an action per se, apart from that of the sulphanilamide which it liberates. Perhaps the most solid argument in favour of this idea is that weight for weight prontosil is therapeutically the more effective; the amount of sulphanilamide which it liberates is distinctly less than the amount of sulphanilamide itself which has to be given to achieve the same result. Other arguments adduced by Domagk are the variability of effect in different animals (inconsistent for evident reasons with the supposition of a simple action on bacteria), discrepancies between in vivo and in vitro effects (to be discounted owing to the unduly heavy inoculum used in his vitro tests), and the fact that other therapeutically active compounds such as Uleron are not reduced to sulphanilamide in the body. This last point, also emphasised by Levaditi,[95] seems to me to have singularly little force; no one wishes to maintain that sulphanilamide is the only directly active compound in the series, nor need it be supposed that other colourless compounds require conversion to it; the question at issue is whether the azo linkage of prontosil has to be broken to secure activity. Opposition in France to the English-American view has taken the form of propounding several highly speculative alternative hypotheses. Levaditi and Vaisman[97] believe that prontosil prevents capsule formation by streptococci, so rendering them susceptible to phagocytosis; Mayer[112 113] and Levaditi[94] postulate the conversion of sulphanilamide itself in the body into some other and more active substance (Levaditi's crucial experiment in support of his belief in this matter has been repeated by Colebrook[28] with an opposite result), while Levaditi and Vaisman[98] also claim to have proved that prontosil neutralises streptococcus toxins (leucocidin and hæmolysin). Meyer[117] also reports experiments in which hæmolysin was neutralised or its formation prevented, and Osgood[127] observed the absence of hæmolysis in streptococcus cultures containing sulphanilamide. I believe this

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phenomenon to have little practical significance; in my experience many antiseptics which have no chemotherapeutic action will inhibit hæmolysis in culture when present in concentrations insufficient to prevent growth. I can also add to the evidence on this aspect of the subject the personal observation that prontosil does not neutralise Dick toxin.† Gley and Girard [62] claim that exposure in vitro to either prontosil or sulphanilamide diminishes the virulence of streptococci; this is unconfirmed.

It is still open to anyone to believe either that the action of these drugs is simple or that it is complex. If the former, they are simply antiseptics effective in vivo; if the latter, then some of the more speculative conclusions here quoted may prove to embody some aspect of the truth.

Therapeutic Action

STREPTOCOCCAL INFECTIONS

The action of these compounds in the majority of hæmolytic streptococcal infections is now a matter of almost universal experience, and not one demanding proof. In the following analysis, therefore, only a selection of the more significant published experiences will be quoted. It is important first to recognise that susceptible infections are only those due to *Streptococcus pyogenes*; those due to *S. viridans*, such as subacute bacterial endocarditis, and to *S. fæcalis* (urinary tract infections due to this organism) are uninfluenced. Even within the present rather wide scope of the term *S. pyogenes* there are resistant types. Bliss and Long,[11] having failed to cure 4 cases of urinary infection by hæmolytic streptococci with sulphanilamide, ascertained that these streptococci were of Lancefield's serological group D; subsequent studies of bacteriostatic action in vitro showed that whereas groups A and C are fully susceptible, the effect on groups B, E, and G is variable, while on D there is none. Fortunately from this point of view, almost all serious infections in man are due to members of group A.

While there are several valuable reports [69 102 104 154] embracing a variety of streptococcal infections, it will be more convenient to deal with these conditions separately.

Erysipelas.—There is almost complete unanimity on the uniformly good effect secured in this disease. In most of the more extensive series of published cases [3 8 16 118 151] prontosil was the drug used, and its action has been compared with that of other remedies such as ultra-violet light and antitoxin. Spread is usually arrested forthwith, and fever often abates within 24 hours. It may be that erysipelas is pre-eminently amenable to treatment owing to the vascularity of the lesion, which allows full access by a remedy circulating in the blood; the conditions are certainly much more favourable than in, for example, an abscess or a septic thrombus. The only adverse reports on the treatment are those of Hartl,[72] who saw no good effect at all (possibly because he used the intravenous route) and Angerer [3] who makes a distinction between simple and complicated cases; in the latter, where erysipelas was superimposed on some other condition or vice versa, no less than 26 of his 38 cases died.

Tonsillitis and scarlet fever.—Many authors mention favourable results in acute tonsillitis and pharyngitis, but extensive studies are few. Gallagher [57] used sulphanilamide in an epidemic, and concludes that adequate dosage hastens the disappearance of streptococci from the throat, wherein he differs from Smith,[150] in whose experience cases recovering after treatment with sulphanilamide or proseptasine remained carriers for several weeks. Gallagher mentions that his routine included forced fluids; this measure is incompatible with fully efficient sulphanilamide treatment, since, whatever else it may do (itself perhaps a matter meriting critical inquiry) it hastens the elimination of the drug itself. I have been unable to find any record of an adequate study of the action of sulphanilamide in scarlet fever. Peters and Harvard [131] treated 150 cases with Proseptasine; the duration of fever was slightly longer then in 150 control cases, and the frequency of complications was somewhat less.

Otitis media and meningitis.—These may rightly be considered together, since almost all the streptococcal meningitis treated has been otogenic. Hageman and Blake [69] record that under sulphanilamide treatment otitis media usually subsides without discharge and mastoiditis without operation. In streptococcal meningitis the effect obtained has evidently astonished those who have witnessed it. There is no doubt that this disease, once almost invariably fatal, is amenable to treatment, but there is still uncertainty how best to administer it. Flake and Carey,[50] whose 4 cases all recovered, gave sulphanilamide intrathecally as well as subcutaneously and by the mouth. Neal and Appelbaum [121] also used the intrathecal route, but appear doubtful of its necessity; 13 of their 17 cases recovered. Schwentker et al.[147] treated 4 cases, 3 recovering, with prontosil and sulphanilamide given variously. Trachsler et al.[157] who had 7 cases with 4 recoveries, and Weinberg et al.[162] with 2 successful cases, used prontosil intramuscularly and sulphanilamide orally, avoiding the intrathecal route; Cawthorne [26] is also doubtful of its value. It seems generally agreed by those who have injected 0·8 per cent. sulphanilamide in saline intrathecally that this proceeding is free from danger, but prontosil given in this way has caused violent febrile and local cellular reactions.[119 147]

Puerperal fever.—The extensive and careful studies made in the Isolation Block of Queen Charlotte's Hospital are familiar to readers of this journal, and need only be summarised briefly. Owing to the previous existence there of a full service for the ætiological as well as therapeutic study of puerperal fever on a large scale, the material and the means were available for a therapeutic trial more complete than has yet been possible in many conditions other than puerperal fever. The earlier reports by Colebrook and Kenny [30 31] deal with a total of 64 cases treated with prontosil; more recently Colebrook and Purdie [32] have described the effects in 106 cases of using sulphanilamide. This has been given orally, sometimes in very large doses (up to 15 g. daily in severe cases), or by intravenous drip in cases vomiting. Among the prontosil-treated cases there were only 3 deaths, and in the sulphanilamide series 8, due mainly to causes outside the influence of the treatment, such as pulmonary or cerebral embolism and hæmorrhage. The mortality of streptococcal puerperal sepsis, previously 20 per cent., has thus been markedly reduced, and comparison and analysis are used in every possible way in these papers to distinguish therapeutic effect from a possible diminution in the natural severity of the disease. If the invasive capacity of *S. pyogenes* is indeed undergoing spontaneous diminution, cases with proven septicæmia cannot be considered to have gained advantage from this, and it is therefore highly significant that the mortality among such cases, previously 71 per cent., has fallen to 27·3 per cent. Gibberd,[60] analyses the same cases by a method similar in principle; including only those in which infection spread beyond the uterus, and excluding deaths, he found a distinct shortening in the average time of illness; the frequency of general peritonitis was also greatly diminished. The present view taken at Queen Charlotte's Hospital is that the effect of prontosil in severe cases is slightly superior to that of sulphanilamide. A striking report from elsewhere is that of Foulis and Barr [53]; among 22 severe cases, 11 having

† The neutralisation tests in human skin on which this statement is based were made with concentrated toxin kindly supplied by Dr. R. A. O'Brien.

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septicæmia and 3 peritonitis, only 1 died; the majority were treated with large doses of sulphanilamide only, 7·2 g. being sometimes given daily for a week or more.

Other streptococcal infections.—The treatment has been used successfully in various other conditions, including streptococcal pneumonia or empyema, burns, and cellulitis. An adequate series of wound infections is lacking; this would be of interest, since there are indications that connective tissue infection responds less readily than, for instance, erysipelas.

(To be concluded)

UNITED STATES OF AMERICA

(FROM OUR OWN CORRESPONDENTS)

THE BROADCAST ON RHEUMATISM

AT 7.30 P.M., eastern daylight saving time, this day (May 2nd) we heard Lord Horder opening the first international health broadcast on the subject of rheumatic heart disease. His voice came to us every bit as clearly as the voices of the following American speakers from San Francisco and Atlantic City.

NEW FOOD AND DRUG LAW

President Roosevelt has approved a bill giving the Federal Trade Commission jurisdiction over foods, drugs, diagnostic and therapeutic devices, and cosmetics. This law provides that unfair and deceptive acts and practices in the exploitation and sale of foods, therapeutic drugs and devices, and cosmetics in interstate and foreign commerce are to come under the bureau of the commission sixty days after signing. The control of the commission over unfair acts and practices is limited to those which constitute or form unfair methods of commercial competition, including the advertising which is disseminated in interstate or foreign commerce. Only in event of proved danger to health will the offender be liable to fine or imprisonment. A "false advertisement" within the meaning of the act is any advertisement, other than labelling, that is misleading in a material respect. In the case of a drug, no advertisement is to be considered false that is disseminated only to members of the medical profession, contains no false representation of a material fact, and includes or is accompanied in each instance by a truthful disclosure of the formula, showing quantitatively each ingredient. The provisions of the act which relate to advertising originated in bills designed to safeguard the public against fraud and danger to health through the distribution in interstate and foreign commerce of adulterated and misbranded foods, drugs, diagnostic and therapeutic devices, and cosmetics. The advertising of foods, drugs, &c., is therefore vested in the Federal Trade Commission, while jurisdiction over the labelling of such products is to be left with the Secretary of Agriculture, and there will be a similar division of authority with respect to the general control of such merchandise. While it is possible that the new act will lead to some improvement, the division of authority is not in general looked upon with enthusiasm.

CONFERENCE OF STATE HEALTH OFFICERS

The health officers of the several States met in Washington on April 9th–11th with the provincial health officers of Canada for their annual conference. Dr. F. W. Jackson, deputy minister of health of Manitoba, spoke of the attitude of the Dominion toward the provision of medical care. He was supported in the discussion by Dr. R. E. Wodehouse, deputy minister of health for Canada, who aligned himself with the recommendations of P.E.P. for the extension of the health insurance principle. Dr. R. G. Leland presented the point of view of the American Medical Association, contrasting "a constantly improving system of free and independent medicine, consistent with American principles and traditions and in accordance with the ideals and traditions of centuries-old medical ethics," with the state of affairs in foreign countries which have established systems of medical practice "dominated and controlled by the State." His fear for the future is well expressed in the following paragraph.

"If incursions into the field of medical practice are to result ultimately in supplanting the private practice of medicine, and if physicians should ever become mere robots, making diagnoses from card indexes and mechanical gadgets, and prescribing treatment from already prepared and numbered labels, and should patients become a mere collection of interesting human parts to be shunted from one corner to another of a medical repair shop for some heartless and pseudoscientific tinkering, America will have lost one of its greatest institutions—free and independent medicine; and the American people will have lost some of their most valuable human traits—confidence in, respect for, and reliance on the scientific men and women who now endeavor to protect their health and prolong their lives. It is doubtful whether refinements of administrative methods or improvement in public health technique can ever replace or compensate for such a public loss."

Dr. W. C. Woodward, formerly health officer of the District of Columbia, supported the position of Dr. Leland, and expressed the view that, if adequate incomes were available to the mass of the people, sickness caused by poverty would be eliminated and the purchase of adequate care would be possible. Surgeon-General Parran said that the growth of medical knowledge had increased the cost of applying the sum total of that knowledge for the benefit of the patient, and good medical care was beyond the reach of an increasing number of persons. Half of all illness was among the very poor, one-fourth in families actually on relief. More than half a million persons in the United States were unemployable because of accident or disease, much of it preventable. It was not only humane but good business to provide for a national health programme which must be adaptable to the varying needs of the State and community. Our ability to prevent disease far exceeded our ability to control the causes of poverty. Medicine, he said, can give hope and confidence to an age almost despairing that man's intelligence will keep us from reverting to barbarism.

REDUCTION OF PNEUMONIA MORTALITY

Dr. Joseph W. Mountin, of the U.S. Public Health Service, exhibited charts illustrating the great variation of pneumonia mortality in different areas of the country, the highest figure being found in three areas: the Colorado plateau, the Atlantic seaboard, and the Appalachian highlands. He outlined a programme of epidemiological research in which a bacteriological study will be made on clinical cases and carriers for a period of 12 consecutive months. In each centre of investigation, preferably a city of considerable size, the sample is to include not less than 1000 clinical cases whose sputum and blood will be examined for diagnostic purposes. Investigation of carriers

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will be made through the culturing of nose and throat of some 1000 cases, half of which would have had recent contact with a clinical case. The service is in a position to finance 5 study units during the ensuing year. Each State health department is advised to set up a special unit on pneumonia control. In the discussion Dr. Edward S. Godfrey, Jun., of New York State, pointed out that the mere distribution of serum cannot of itself be expected to control mortality from pneumonia. The typing of the higher series of pneumococci demands quite special skill. Laboratory technicians must be thoroughly trained and the work of the laboratory supervised. Nor can it be assumed that the general practitioner is an expert in serotherapy. In New York State post-graduate courses in pneumonia control are now available and the response has been enthusiastic.

THE TAVISTOCK CLINIC

THE annual meeting and luncheon of the Tavistock Clinic was held on May 9th at the Café Royal. Lord ALNESS, the newly elected chairman of council, invited Sir HENRY BRACKENBURY, the retiring chairman, to say something about the work of the clinic. Three important aspects of that work, Sir Henry said, were continuity, variety, and volume. Since the clinic was founded nearly 20 years ago by Dr. Crichton Miller the work had expanded enormously, but the missionary spirit in which it was founded had continued. In spite of the increase of work, all those engaged in it were anxious that nothing should be done to lower its quality. The clinic had moved to larger premises and hoped in time to come to move to still larger ones. The care of the patients treated called for a large staff and large premises, as well as a few small wards. There was immediate need for support of the current work of the clinic; they could not go on facing an annual deficit of several hundreds of pounds, without being forced to retrench. He suggested that all donors should make a 50 per cent. increase in their gifts for the next two years.

Mr. WALTER F. ROCH, honorary treasurer to the clinic, contributed a sorrowful account of the clinic's finances during the past year. A deficit of £3500 had been met by selling all realisable assets and by a reduction of honoraria to the medical staff; indeed they had now qualified as a sweated industry. If the clinic had been a commercial concern, the outlook for the future would be excellent: the work was expanding, its quality was recognised, and the clinic occupied a good site with ample room for future extension. But unfortunately the clinic was not a commercial enterprise and increasing work meant increasing debts. The council must look for an ever-increasing flow of contributions.

The CHAIRMAN thanked Sir Henry for his thought-provoking and informative speech and urged all those present to spread the evangel of the clinic. He was a hard-worked chairman, for at the luncheon which followed he welcomed the guests and introduced the Earl of FEVERSHAM, Parliamentary Secretary to the Ministry of Agriculture and Fisheries. Nobody, Lord Feversham said, liked to see a valuable asset turned into an expensive liability to the State. He had worked as a probation officer and had concluded that crime was an external expression of a deep-seated psychological cause. In his present occupation he was dealing with sub-human species, but he believed that to see nature in the raw you must turn to man. He hoped that in the next generation the work of the clinic would be apparent in a lower incidence of breakdowns and neurotic conditions.

Mrs. ISRAEL SIEFF paid a tribute to Sir Henry Brackenbury who, she said, had guided the clinic through lean and hungry years. The work of the clinic showed that 50 per cent. of neurotic conditions could be cured or permanently relieved, and she thought this no mean achievement for a branch of medicine in the pioneer stage. There were some invalids who inspired confidence and happiness in those about them, but the neurotic was not among these. The neurotic spread unhappiness. A profound relaxation of tension was experienced by those families in which a neurotic had been restored to mental health.

Dr. J. R. REES, medical director of the clinic, mentioned the closed waiting-list of the clinic, with 400 names upon it. How many of those patients, he wondered, would have committed suicide and how many would have to be certified before treatment could begin for them. Psychoneurotics had been estimated at 7 per cent. of the population; that is to say, if anyone wrote down the names of the first 14 of his friends who came into his head, he would find at least one who could do with some readjusting. Follow-up work at the clinic showed that 50 per cent. of patients were permanently improved, and among children this figure rose to 70 per cent. He urged those present to help to keep this work alive and effective.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED APRIL 30TH, 1938

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 1936; diphtheria, 1055; enteric fever, 20 ("expected" 27); pneumonia (primary or influenzal), 1270; puerperal pyrexia, 182; cerebro-spinal fever, 32; acute poliomyelitis, 5; acute polio-encephalitis, 1; encephalitis lethargica, 7; dysentery, 37; ophthalmia neonatorum, 121. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on May 6th was 4917, which included: Scarlet fever, 808; diphtheria, 1056 (carriers 49); measles, 1718; whooping-cough, 295; puerperal fever, 18 mothers (plus 12 babies); encephalitis lethargica, 282; poliomyelitis, 1. At St. Margaret's Hospital there were 23 babies (plus 9 mothers) with ophthalmia neonatorum.

Deaths.—In 126 great towns, including London, there was no death from small-pox or enteric fever, 35 (7) from measles, 4 (2) from scarlet fever, 12 (2) from whooping-cough, 26 (2) from diphtheria, 37 (10) from diarrhœa and enteritis under two years, and 63 (8) from influenza. The figures in parentheses are those for London itself.

Measles proved fatal in 21 great towns, Hull having 3 deaths. Liverpool reported 4 deaths from whooping-cough. Diphtheria was fatal in 21 great towns, none reporting more than 2 deaths. There were 11 deaths from influenza in Birmingham, 4 in Hull, 3 in Bristol.

The number of stillbirths notified during the week was 300 (corresponding to a rate of 39 per 1000 total births), including 40 in London.

TYPHOID AT HAWICK.—More than 50 cases of typhoid have occurred at Hawick, a parliamentary burgh of 17,000 inhabitants in Roxburghshire. The cases are widely distributed over the town, a large proportion of them being women. No deaths have been reported. The water-supply was overhauled a few months ago and the cause of the outbreak has not been ascertained. The usual precautionary measures have now been taken.

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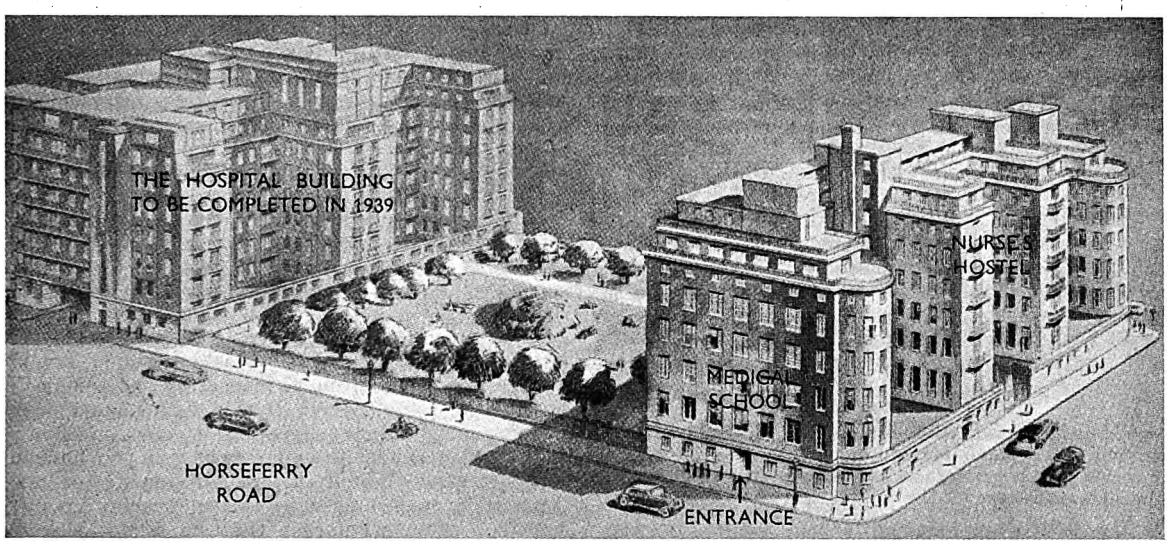

OPENING OF THE NEW WESTMINSTER MEDICAL SCHOOL

ANOTHER step towards the completion of the Westminster Hospital was taken on May 12th when the Earl of Athlone opened the new medical school. The school occupies one-third of the block on the west side of St. John's-gardens in Horseferry-road, the other two-thirds being taken up by the nurses' hostel which was opened in March. The hospital itself is on the east of the gardens and will be ready for occupation in April of next year. For 52 years the medical school was in Caxton-street where it moved after leaving its first home through the construction of Victoria-street. Since 1903 its students have done their preclinical work at King's College. The completion of the new buildings will finally remove the inconvenience of geographical separation of the school from the clinical material of the hospital.

The new school is an eight-storied building which will provide the student with opportunities for rest, recreation, and exercise, as well as education. His bodily needs will be catered for particularly in the basement, in the ground floor, and on the roof, while the rest of the building will be dedicated to his mental improvement. On the ground floor there is a comfortably furnished common room, a refectory on the cafeteria system where 80 students at a time can be served from the adjoining kitchens of the nurses' hostel, a smoking room, and a small bar. In the basement is a billiards room, a gymnasium, and a squash rackets court, with the necessary shower baths and rooms for changing and drying clothes. In the summer the student will be able to study or rest from his labours on the flat roof.

The main lecture theatre which seats 250 occupies the depth of two floors, with entrance on the ground floor, and contains a film projector and epidiascope of the latest type. Most of the first and mezzanine floors are taken up by the library and museum, the latter having a gallery in which microscopical preparations are displayed. On the second floor is the main class room with its desks set in tiers so that everyone has an uninterrupted view of the blackboard and projector screen, and on this floor also is the class preparation room and a smaller lecture theatre to seat 50. The third and fourth floors contain the pathological laboratories and workshops, both for teaching and the routine work of the hospital. The main clinical laboratory, named to commemorate the generosity of John Burford Carlill, is divided into cubicles for individual workers and is provided with a built-in refrigerator room and one maintained at body temperature.

On various floors there are rooms for the examination of patients and for special tests on the living subject, in the design of which special care has been

taken to ensure seclusion, so that emotional disturbances may be eliminated as far as possible. The biochemical laboratory is on the fifth floor and on the sixth is the physics department with research rooms and the laboratory for the special study of radium emanations. Here too is a large room for

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operative surgery and an anatomical museum for advanced students. Finally, the seventh floor is mainly given over to the research workers. In addition to their laboratories and separate library there is an X ray plant for the examination of post-mortem specimens and for pathological research and the apparatus for clinical photography and photo-micrography.

The entire cost of the school is being met by a fund distinct from that raised for the rebuilding of the hospital and nurses' hostel, and subscriptions are urgently required to meet the £15,000 still outstanding.

GRAINS AND SCRUPLES

Under this heading appear week by week the unfettered thoughts of doctors in various occupations. Each contributor is responsible for the section for a month; his name can be seen later in the half-yearly index

FROM "SILVER DOCTOR"

II

HOW IT GOES

Opsonins neglected, vaccines past their best,
Serums still in some demand, hormones in request,
Vitamins are booming and a necessary pest,
But endocrines are all the rage to activate the rest.

WHAT is the explanation of the sudden cardiac deaths which occur nowadays so frequently, and not least among our own profession? Is coronary thrombosis more common or only more exactly diagnosed than heretofore? What is its immediate cause? There always has been an element of mystery about blood-clotting, and modern biochemistry does not explain entirely its whys and wherefores. Diseased blood-vessels do not appear to be the complete answer. Does the modern increase of cigarette-smoking and/or motor-exhaust fumes play any part? Now then cardiologists, what about it?

* * *

Recently a fresh spate of cheap wit has poured contempt on the "bedside manner." Assuredly there was a time when undue importance was attached to externals in the relation between doctor and patient. This was a relic of the days when medicine was confused with magic, and its professors sought to dazzle their dupes by an atmosphere of mystery. To-day medicine has emerged into the light as a science and an art, doctors are recognised as nothing more and nothing less than trained experts, and frock-coats have gone the way of gold-headed canes. Once and forever we have exploded any idea that fine feathers make fine medical birds. Yet I suggest that the pendulum has swung too far and too fast, and that there is, and always must be, the need for a properly conceived "bedside manner." A patient comes to a medical man to discuss symptoms which may involve the most intimate matters and any or every consultation may deal with questions of life and death. The doctor's ability to help remains the same whether he is clad in the latest thing in morning-coats or a dilapidated suit of fishing-kit. Yet an element of anxiety is inseparable from every consultation and this demands recognition. Seemliness is a constant in the transactions of civilised life and nowhere is it more deeply rooted than in the British character. Every patient is influenced by impressions derived from external appearances, and such details as clean hands, spotless linen, quiet clothes, and a sympathetic manner go far to ensure a patient's confidence. Even to-day it is not everyone who appreciates the smell of tobacco, yet how many practitioners ignore this. Clothes certainly do not make the man; yet it is equally certain that coloured pull-overs, grubby collars, and grimy flannels are out-of-place in the sick-room, and there was a sting in the saying of one patient about doctors that "by their hands ye shall know them"! Recently I heard a surgeon pour scorn on the "waste of time" involved by the ancient custom of inspecting the tongue and feeling the pulse. Even if this performance taught nothing (a ridiculous suggestion) it gives a patient the opportunity to note the manner of man to whom they are entrusting their lives. No time is wasted which is spent in examining a patient or hearing his story, yet how often we forget that he is not the least interested in our family triumphs, our views on Art, or our golfing successes. Self-consciousness is a crime in any doctor, and the man who is so good-looking or so ugly that he cannot forget it is of little use in our job. It may not be given to every practitioner to possess the personality which appeals to the sick man, but he should cultivate those lesser graces which reassure the invalid. A "bedside manner" founded on these ideals is the bounden duty of every doctor.

* * *

As a guess I suggest that "three times a day" is one of the most familiar phrases of our mother-tongue, associated by millions of English-speaking people with a doctor's instructions. Every type of patient—fat or thin, male or female, old or young, black or white; each dilapidated organ—liver, lungs, heart, nerves, tummy; all alike are doomed at some time or other to a recurring potion three times a day. Maybe this was all very right and proper in days gone by, yet in the name of Hippocrates himself why this everlasting *three*?

One pictures the original doctor of all time confronted by his first patient. Did he then and there with one almighty brain-wave conceive the three-fold function? Or was it as the outcome of trial-by-error experiment with hourly, daily, or weekly doses of apple-extract or fig-leaf decoction that the fiat went forth to echo down the centuries "three times a day"? Maybe there is more in this *3* business than appears at first sight. Everywhere the magic figure turns up. Why do we call for *3* cheers, or in superlative moments *3* times *3*? Who ordained that the drowning subject should come *3* times to the surface? Why is the *3rd* time proverbially "catching-time"? Was it a coincidence that Jonah spent *3* days and *3* nights in the whale's interior? Why *3* blind mice and *3* men in a boat? Why did the poet sing "Of the three hundred grant but *3* to make a new Thermopylæ"? Is it conceivable that not arithmetic alone but the universe itself revolves round a *rule of three*?

However its origin and whatever its past virtues, doctors follow too slavishly this ancient custom. The "thrice daily" business has become an obsession. House physicians and clinical assistants in hospital are prone to order every patient his three daily doses as a matter of routine, while the average practitioner is apt to conceive that his duty begins (and sometimes ends) with a similar performance. No wonder

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nowadays that nurses and patients alike are unsatisfied unless and until the threefold ritual is enacted. The thing has grown into a habit.

Dogma dies hard, and "something out of a bottle" is still the constant demand of many invalids. Doctors must preach *and practise* in and out of season that drugs are not required in every case. To-day there is over-much playing with palliatives, and a real danger of forgetting the usefulness of such measures as routine, rest, exact diet, periods of starvation, planned exercises active or passive, bath treatment in its many forms, cuppings, counter-irritation, and the like. In acute cases drugs should be given at short intervals for a definite period and stopped when the required effect is obtained. In more chronic affections drugs may be necessary for a longer time, but in many of these one or two doses in each 24 hours is often sufficient. Placebos have a limited usefulness but the unwholesome clamour for the medicine bottle must be checked. The army of unnecessary drug-takers is a pitiful reproach to our profession, who alone can dispel the delusion that t.d.s. is the sure road to health.

* * *

In January's Grains and Scruples A Bacteriological Back-number discussed the pros and red-inked the cons of artificial immunisation with the pen of a master. My own communication is privileged by virtue of a comparative ignorance. As an honest clinician I hesitate to venture into such deep waters, but a sense of duty urges the record of a personal hair-raising experience. That it concerned the injection of a curative rather than an immunising serum is a mere quibble. The serum's the thing. A Bacteriological Back-number sounds a warning of the dangers of serum injection in no uncertain words when he writes "no method involving a parenteral injection is without a significant risk and when injecting a healthy individual with anything we are always skating on thin ice." Here is a case when the ice gave way to a tragedy.

While staying recently in an hotel I received an S O S from a colleague in an adjoining suite. There I found a distressed doctor performing artificial respiration on a young woman to whom a few minutes previously he had given an injection of antidiphtheritic serum. The patient had been under observation in bed for two days with sore-throat, fever, enlarged glands, and a suspicious tonsillar patch. She collapsed within two minutes of the injection. The girl was unconscious, white, pulseless, and gasping. Adrenaline, brandy, strychnine, and artificial respiration proved of no avail and twenty minutes later she was dead.

Subsequent investigation threw little light on the exact cause of this distressing catastrophe. Nothing was found wrong with the serum, its dosage, or the details of its administration. The girl was organically sound, she had never had any previous injection, nor was there the history of asthma or other allergic manifestation. She had not seemed seriously ill. Most tragic of all, the subsequent bacteriological examination of a throat swab (very properly taken before injection) proved the absence of diphtheritic bacilli. The death certificate was worded "tonsillitis, serum injection, anaphylaxis, cardiac failure," though "medical misadventure" would have been equally truthful.

It is not pleasant to reflect that this tragedy was the direct result of medical treatment and that we are largely in the dark as to how and why she died. Such deplorable accidents fortunately are rare and are not always published. I record the case, firstly because of an uncomfortable conviction that the present generation of practitioners and medical students is not sufficiently alive to a terrible possibility, and secondly as an urgent plea for renewed research into the mysteries of acute serum reactions.

It is essential to preserve a due sense of proportion. There is no question of the overwhelming benefit of serum treatment and the small proportion of its disasters, yet however rare these may be they cannot but make us think. Anaphylaxis is a comfortable long word which covers a wealth of ignorance. Its minor manifestations are comparatively common. Surely these should serve as a basis from which to evolve its essential nature and how it may be avoided, while the modern frequency of blood transfusion ought to aid in a similar direction.

MEDICINE AND THE LAW

Lead Poisoning and Water-supply

LAST week the Court of Appeal confirmed a decision whereby at Manchester assizes a plaintiff and his wife were awarded damages for lead poisoning due to drinking the water supplied by the Irwell Valley Water Board. The trial judge had held that the defendants fulfilled their statutory duty of supplying pure and wholesome water in their mains. But the water, being soft, was plumbo-solvent; it absorbed lead from the service pipes in the plaintiff's house. The defendants had failed in their common-law duty to warn consumers that they must take precautions because the water had a capacity to absorb lead from leaden service pipes. The defendants, it appeared, had adopted measures for hardening the water. There had been about six cases of plumbism in a population of 16,000 during the six years before the hardening plant was installed. After the installation no further cases occurred.

The Court of Appeal emphasised that the defendants had been repeatedly warned of the risk that their supply would be contaminated before reaching the consumers. There were complaints by consumers from 1929 to 1935; but it was a long time before any measures were taken to make the water harmless. The water board could easily have taken one of two steps. It could either have adopted some method of reducing the plumbo-solvency of the water, or it could quite simply have sent consumers a circular warning them to draw off a certain quantity of water which had been standing in the pipes before using the water for drinking purposes. The water board, through its agents, had been negligent. Lord Justice MacKinnon pointed out that the defendants knew a great deal about the risk of plumbo-solvency; yet they had exposed their consumers to the danger without warning. Scientific knowledge on these matters, he said, had greatly advanced in recent years. In 1902 the Local Government Board held an inquiry into the plumbo-solvency of moorland water-supplies. As a result in various local Acts of Parliament there have been inserted special provisions requiring water undertakings to treat the soft water. A common-form clause insists that, if it appears to the undertakers that the water supplied is "liable to act upon lead in such a manner as to endanger the health of the consumer," they must forthwith treat the water so as to prevent such action. The county medical officer of health is sometimes authorised by such clauses to take steps to secure the necessary treatment, and there is sometimes a statutory penalty of £5 for every day during which the undertakers make default in complying with the requirement.

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CORRESPONDENCE

BLOOD PRESSURE IN SCARLATINAL NEPHRITIS

To the Editor of THE LANCET

SIR,—In his paper in your issue of April 30th (p. 999) Dr. R. Workman Carslaw, from his experience of 50 cases of scarlet fever, came to the conclusion that it was impossible to diagnose early post-scarlatinal nephritis by daily blood-pressure readings. This conclusion is confirmed by my observations many years ago [1] when I published a paper on blood pressure in scarlet fever based on the study of 122 cases. Of the 33 cases in this series which developed nephritis only 12 showed any hypertension, which was never extreme or of long duration, while in the remaining 21, whose ages ranged from three to twelve years, the systolic blood pressure did not rise above 110. The absence of any rise of blood pressure in many cases of post-scarlatinal nephritis and the large number in which only a slight and transient rise was noted are in keeping with the fact that scarlatinal nephritis is as a rule a benign affection, the great majority of such cases ending in complete recovery. In the early days of clinical sphygmomanometry T. Janeway,[2] like most physicians interested in the subject, hoped that it would furnish most important indications in acute infectious disease. Some years later,[3] however, he had to confess that that hope had been disappointed. "I think," he wrote, "that most of us must now agree with the conclusions of Kurt Weigert from his extensive studies of the acute infections, and which have been confirmed for scarlet fever by Rolleston, that the value of the blood-pressure measurement for prognosis in the acute infectious diseases is slight. It is an additional factor which is occasionally useful, as in typhoid patients with hæmorrhage, but for the most part the simpler observations made by our predecessors in clinical medicine of the facies, the tongue, the pulse, and the heart sounds, and the state of the nervous system, make the prognosis equally well without a knowledge of the blood-pressure curve."

I am, Sir, yours faithfully,

London, W., May 7th. J. D. ROLLESTON.

TESTOSTERONE PROPIONATE, THE ANTERIOR PITUITARY, AND HYPERTHYROIDISM

To the Editor of THE LANCET

SIR,—In your issue of Feb. 12th I reported that the male hormone, testosterone propionate, if given in adequate doses, renders the endometrium atrophic. But it remained doubtful whether it acts on the endometrium itself, on the ovarian follicle (antagonising the female hormone), or on the sexual motor, the anterior pituitary. To answer this question I ascertained the amount of gonadotropic hormone in the urine in women receiving testosterone for hæmorrhage at the menopause, and found that under treatment it either disappeared or diminished, according to the dosage. This demonstrates that testosterone acts through the pituitary—a conclusion supported by the observation of J. B. Hamilton and J. M. Wolfe (*Endocrinology*, March, 1938,) that in rats it suppresses production of gonadotropic substances by the pituitary.

If, indeed, the male hormone blocks the production of gonadotropic hormone by the anterior pituitary it may also interfere with the action of the other anterior pituitary hormones, such as the thyrotropic, adrenotropic, and growth factors. Accordingly, on the assumption that hyperthyroidism may be caused by excessive secretion of thyrotropic hormone, testosterone has been tried in Graves's disease, and I am able to report the first success with this remedy.

The patient, a girl of 14, is being treated by Dr. S. F. Seelig in St. John's Hospital, Lewisham, London, according to my suggestions. She had conspicuous exophthalmos, a diffusely enlarged thyroid, excitability, tremor, and a pulse-rate of 150. She had lost weight during the last few months and was suffering from insomnia; rest in bed with administration of bromide and phenobarbitone failed to bring the slightest improvement. Under the influence of 850 mg. of testosterone propionate, given over a period of two months, the thyrotoxic symptoms diminished considerably. Although the patient was not kept in bed, and received no drugs, her weight increased, the pulse-rate dropped to 84, the tremor became hardly visible, and the exophthalmos lessened. Excessive perspiration vanished and she became much calmer. The treatment began on March 1st and improvement has continued from that time onwards.

Though it is too early to judge of the permanence of the cure, the evidence of this case suggests that testosterone propionate can be used to reduce excessive thyrotropic activity on the part of the pituitary gland. The effect of the treatment was to perform a partial temporary functional hypophysectomy. In my latest cases I have found that this effect can be attained not only by injecting the male hormone, but also by rubbing it into the skin. The percutaneous dose corresponds to the dose given intramuscularly. The results of the above investigations were reported by me to the International Congress of Obstetrics and Gynæcology held in Amsterdam last week.

I am, Sir, yours faithfully,

London, W., May 10th. ALFRED A. LOESER.

PYLORIC STENOSIS IN TWINS

To the Editor of THE LANCET

SIR,—Dr. Sheldon's interesting paper in your last issue illustrates two common fallacies in twin research, which tend to bring the method into disrepute. Under the title "Hypertrophic pyloric stenosis in one of uniovular twins" he mentions that 22 out of 23 twin pairs were discordant for this disease, and that the number of twins in his material was unduly large. Since roughly one-third of all twins are monovular, and since on the basis of a single Mendelian recessive a quarter of the binovular male pairs ought to be concordant, the obvious deduction is that even in this tiny sample some 7 twins with faulty genes have failed to develop the disease. The case report which is given supports this deduction and the general impression left by the article is that in the ætiology of pyloric stenosis important environmental factors are involved which, since we are dealing with twins, *must be extra-uterine*.

Such a conclusion is quite unjustified on the evidence presented. Assuming for the purpose of simplification that pyloric stenosis occurs only in male infants, and making one or two other minor adjustments, the following calculation is sufficiently accurate. In 2000 births there will be 25 twin births producing 4 pairs of uniovular males, the same number of binovular male pairs, 8 pairs of unlike sex, and 8 female pairs. Among 1000 male infants selected

[1] *Brit. J. Child. Dis.* 1912, 9, 444; Acute Infectious Diseases, 2ED, 1929, p. 271.
[2] Clinical Study of Blood Pressure, 1904.
[3] *Bull. Johns Hopk. Hosp.* 1915, 26, 348.

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at random from an infinite population there will be 8 uniovular and 8 binovular twins (each with a brother who does not come into the sample), and 8 binovular male twins with a sister, 24 twins in all, a number which agrees with Dr. Sheldon's 23. Admittedly Great Ormond-street does not draw on an infinite population, but between 1912 and 1936 sufficiently large numbers are involved for this to be a negligible source of error.

It is the sex distribution of Dr. Sheldon's material, however, that should have warned him that something odd was happening. Whereas there ought to be twice as many twins with brothers as twins with sisters, actually there are as many, or more, pairs of unlike sex. This type of distribution is a common one: it is usually ascribed to the fact that when both twins do badly the feeding or some other environmental factor is blamed; when only one infant does badly the mother rightly argues that the fault lies in the baby and goes to a clinic straight away without wasting time experimenting.

These 23 pairs of twins are thus a grossly selected sample, about 10 pairs being missing. One inference is that most of the missing pairs were uniovular and binovular concordant.

The second fallacy in Dr. Sheldon's paper is the proof of monozygotism in the case reported in detail. Binovular twins frequently share a placenta, just as monovular twins often have separate ones. The decisive point is that when there is a common placenta the circulations of monovular twins anastomose and under these circumstances the birth-weights tend to differ, one twin or other having an advantage. The common placenta with agreement in birth-weights is therefore an argument against monozygotism, just as is the disagreement in finger-prints. In fact in the teeth of the objective evidence, on the strength of a subjective impression of resemblance without any of those corroborative details which an expert would provide, we are asked to believe that of two twins with an identical genetical composition and an identical blood-supply (which appears to have been so evenly distributed that the birth-weights agree) one twin is exposed to an environmental factor at birth or soon after, which the other avoids, and that this factor acts so quickly that within a few days signs of stenosis develop.

Dr. Sheldon may be quite right; if he is, his observation is of unusual importance because it is possible to exclude the intra-uterine differences so often present in the case of monovular twins. At any rate he owes it to the many scientists who will read his paper with interest to find someone with a hand-lens and a knowledge of skin genetics who will confirm or disprove the diagnosis of monozygotism.

I am, Sir, yours faithfully,

Oxford, May 8th. DENYS JENNINGS.

AN OVERCROWDED PROFESSION?

To the Editor of THE LANCET

SIR,—May I revert to the letter signed M.D., M.R.C.P., which appeared in your issue of April 30th? This letter suggested that the Medical Peace Campaign is proposing that refugees should be free to enter this country and to fill posts in an already "overcrowded profession." No such proposal has been made by the Medical Peace Campaign. In an earlier issue (March 26th) of this journal appeared a letter, signed by a number of distinguished medical men, which expressed the hope that some support might be given to our colleagues excluded from their posts in Austria. I am confident that the signatories had no intention of prejudging the case raised in our own country by the presence of refugees. It is in the opinion of our committee a problem that requires earnest discussion by the whole profession; and, appreciating that the Austrian coup d'état was associated with a display of armed force, we decided to republish the letter for wider distribution.

I am, Sir, yours faithfully,

W. HOWARD HUGHES.

St. Mary's Hospital, W., May 9th.

HEARING-AIDS FOR DEAFNESS

To the Editor of THE LANCET

SIR,—Further to Mr. Macleod Yearsley's letter, I would like to point out that, following research carried out at Manchester University by Drs. Littler and Ewing, they state in their pamphlet "Auditory Fatigue and the Use of Tuned Telephones with Hearing Aids," on p. 7:

"Recently we examined the records of 10 unselected children who have used hearing-aid apparatus similar to that employed in our speech experiments daily for periods of two years and upwards. They were tested with a pure-tone audiometer both at the beginning, at intervals, and at the end of a period. In none of these cases had any falling off in acuity occurred. In some instances the test results were better at the end of the period of using the hearing-aid apparatus."

Then we read in the National Institute for the Deaf's pamphlet, "The Choice of a Hearing Aid" (p. 3):

"There appears to be no clinical or experimental evidence that the continued use of a hearing-aid causes any increase in existing deafness nor, except in a few rare cases, does it improve or restore hearing. Nevertheless, the benefits from a satisfactory and appropriate instrument are very definite both to the patient and his friends."

I may be wrong, but I believe this is also an extract of opinion from the same source as the one given earlier. There would also seem to be reason to think (not, unfortunately, clinical or scientific evidence) that cases are not entirely unknown where the use of a hearing-aid has actually so far assisted the function as to result in the discarding of this assistance after some months, as redundant.

No one can quarrel with Mr. Yearsley's second point that it is the duty of an aurist to send his patient to an "honest" firm. It is the greater pity that so distinguished an aurist has not gone a little further with his investigations however. To send a patient to a surgical instrument maker is to send him to a selling agent (sometimes one buying such aids through the second-hand columns of the *Exchange and Mart*) instead of to the manufacturer and "specialist" (in the lay sense of that abused word). It must be agreed that the surgical instrument firms are not likely to attempt exploitation, but the system of permitting trial for two or three weeks is full of pitfalls, and actually results in many who could have been satisfactorily fitted being "sent empty away," too often convinced that their case cannot be assisted. Moreover, it should be remembered that those agents who charge the *officially recommended* 5 per cent. of the cost of the aid under trial, can "turn over" the initial cost of that aid in a short period—and still have it on their hands for further unsatisfactory "trial" at the same time.

Now, we find the late Prof. Fraser-Harris saying in your columns (*Lancet*, 1934, **2**, 481):

"Strange as it may appear, there is no body of persons who are qualified to interpret an aurist's prescription for a deaf patient, and to supply the

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appropriate deaf-aid instrument, as there are opticians able to read an oculist's prescription and to provide the spectacles specified. Just as it requires a specialist—the oculist—to ascertain the precise nature and amount of departure from normality in vision, so it requires a skilled person to ascertain the precise kind and degree of deafness from which a deaf patient may be suffering. There are types and degrees of deafness just as there are types and degrees of departure from normal visual acuity."

Is not the inevitable conclusion that the time has arrived for an effort to be made to form a corporate body corresponding in aims and training to that of the opticians? It should have recognised examinations, so that aurists and physicians can know when they are recommending their patients for the fitting of an aid that they are in effect recommending a man qualified by training and experience to undertake the task. It is, of course, assumed that such a body would have ethical ideals and would take steps to see that these were lived up to by those entitled to use such qualifications. Such a move would be welcomed by the reputable and experienced firms of standing.

I am, Sir, yours faithfully,

Gt. Ormond-street, W.C., May 4th. L. T. E. WEBB.

OBITUARY

ARTHUR PEARSON LUFF, C.B.E., M.D., F.R.C.P. Lond.

Dr. Arthur Luff, who died at Limpsfield on May 1st aged 82, was a notable member of the chain of physicians attached to St. Mary's whose contributions to forensic as well as to clinical medicine have brought renown to the hospital.

Born in London, the son of Richard Luff, and educated at the Western Grammar School and the Royal College of Science, A. P. Luff taught chemistry for some years before taking his B.Sc. in 1883, having been awarded the Pereira medal of the Pharmaceutical Society in 1874. In 1883 he gained the gold medal of the Society of Apothecaries of London in materia medica and pharmaceutical chemistry. He proceeded to study medicine, qualifying L.S.A. and M.R.C.S. Eng. in 1886 and M.B. Lond. in 1887 with high honours. In the same year he was made lecturer in forensic medicine at St. Mary's, and he continued to hold this post for 21 years, during which period he wrote a two-volume text-book on the subject and, jointly, a very successful manual on chemistry for medical students. As was natural, Dr. Luff's interest remained chiefly in the chemical and toxicological aspects of medico-legal work. As scientific analyst to the Home Office (1892–1908) he figured prominently in many famous criminal cases of poisoning. His gift of precision in the statement of his opinions in the witness-box and elsewhere brought him as much medico-legal work as he could spare time for. As toxicologist he took some part in the discovery of arsenical poisoning as the cause of an outbreak of peripheral neuritis which in 1900 affected the beer-drinking community of Manchester and Salford, an investigation which has since become something of a classic. He remained in touch with developments in toxicology after his retirement from clinical practice, and served on the Departmental Commission on Preservatives and Colouring Matter in Food in 1923.

In clinical medicine Dr. Luff acquired high repute especially for his art in relieving patients afflicted with various forms of chronic painful and crippling disorders. Having taken his M.D. in 1889, he was appointed assistant physician to St. Mary's in 1890, and full physician in 1896, the year of his election to the fellowship of the Royal College of Physicians. His Goulstonian lectures in 1897 on the pathology and treatment of gout were followed by many other publications on gout, chronic rheumatism, and, later, on fibrositis. He was bold enough to give morphia for acute gout at a time when this drug was withheld in that condition for fear of its effect on renal function and this merciful practice soon became general. It was his exceptional ability to make patients comfortable even when he was unable to make them better that brought Dr. Luff well deserved popularity as a physician. He achieved such outstanding success as a consultant that he felt able to cut short his career in 1913 and retire to the country with the intention of devoting his leisure to his favourite pastimes of golf and carpentry. The war brought him back to work on the medical staff of the Third London General Hospital at Wandsworth, and he was mentioned in dispatches for his services as a lieut.-colonel in the R.A.M.C. (T.). Though he returned to country pursuits on demobilisation he acted some years later as honorary director and rapporteur of some collective investigations on varicose ulceration, the after-history of cases of gastro-enterostomy and cancer of the breast which were sponsored by the British Medical Association. The results were published between the years 1928 and 1932.

Dr. Reginald Miller writes: "Dr. Luff's skill in the management of gouty and rheumatic patients, in the days when everything was either gout or 'goutiness,' quickly gained for him a large and fashionable consulting-room practice, and his success was a source of legitimate satisfaction to him. He was kind and most courteous in manner, but was punctilious in matters which he thought affected the prestige of a consulting physician. He was most precise in his methods and made somewhat of a fetish of punctuality. His hospital work was carried out with the utmost regularity, and his arrivals and (still more wonderful!) his departures were timed to the minute. To be late for an appointment with him was to miss the pleasure of seeing him, and many a practitioner was disconcerted to find that after five minutes' grace he had left the house at which a consultation was due. It is a pleasure, even to those who recall him only as a senior member of the St. Mary's honorary staff, to feel assured that the great content which his success in practice had brought to him remained with him during many years spent in retirement."

Dr. Luff married in 1893 Amy A. Leon and had a son and a daughter, Dr. Mary Luff.

EDMUND WILKINSON, F.R.C.S. Eng., D.P.H.

LIKE so many men of his time who joined the Indian Medical Service, Colonel Wilkinson had a distinguished career in India, and after retirement from the service an aftermath at home of influence and importance. Born in 1867 and qualifying from University College Hospital, London, in 1888, he entered the I.M.S. three years later, after holding a series of resident appointments. On military duty in the Punjab he came up against the recrudescence of bubonic plague and became an authority on its

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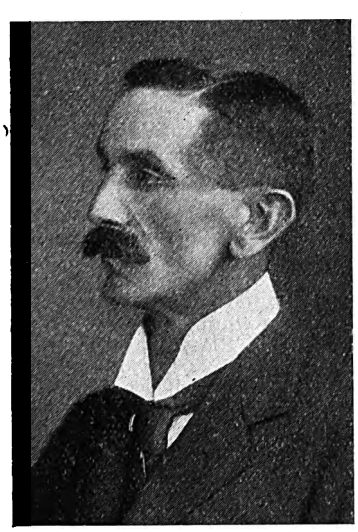
epidemiology. He was in succession chief plague medical officer, sanitary commissioner in the Punjab, and acting sanitary commissioner for East Bengal and Assam. He was the author with C. W. Daniels of a manual of tropical medicine and hygiene. On retirement from the service in 1914 he joined the staff of the Local Government Board. "Here," writes Sir Arthur MacNalty, "his plague experience proved invaluable, not only in port sanitary work but especially in the precautions against the spread of plague by rats in East Anglia. During the late war he secured a large measure of liaison between the military and civil authorities in the arrangements for military camps and hospitals. After the war he was chiefly occupied in port work and investigating epidemic outbreaks. On leaving the Ministry in 1932, Colonel Wilkinson returned to his native Cornwall to administer his estate and live the full life of a country gentleman. He was a good shot, a keen fisherman, and an ardent motorist, snatching time from his many other occupations for colour photography. At Hornacott Manor, near Launceston, his wife and he were always ready to welcome old colleagues. Death met him with mental and physical powers but little impaired."

PERCY FURNIVALL, F.R.C.S.Eng.

THE announcement of the death on May 3rd of Mr. Percy Furnivall, consulting surgeon to the London Hospital, brought distress to a still wide circle of medical friends, though it is 19 years since he retired from practice. Born in London in 1868, he was the only son of the late F. J. Furnivall, Ph.D. He was educated at University College, London, and received his professional training at St. Bartholomew's Hospital, qualifying in 1892 and taking his F.R.C.S. Eng. in 1895, after varied experience in resident posts at St. Bartholomew's and elsewhere. He was elected to the surgical staff of the London Hospital and continued in office as assistant surgeon and then surgeon until ill health caused his resignation from the active staff in 1919. For some years he acted also as surgeon to St. Mark's Hospital for Diseases of the Rectum and to the Metropolitan Hospital. Mr. Furnivall was awarded the Jacksonian prize of the Royal College of Surgeons for an essay on neoplasms of the stomach, small intestine, and colon in 1898, and in 1901 lectured as Hunterian professor on the same subject. He was co-editor with his father of "Thomas Vicary's Anatomie of the Bodie of Man," and wrote the articles on stomach, intestine, and rectum in the second edition of the treatise on the Operative Surgery of Malignant Disease edited by his father-in-law, Sir Henry Butlin, besides other contributions to the surgical and pathological literature of his day.



[Photograph by Elliott & Fry

We are indebted to Dr. Lewis Smith for the following graphic account of Mr. Furnivall as surgeon and friend: "I met Furnivall first when he joined the London Hospital staff, where his outstanding personality, surgical skill, and general charm ensured his popularity. He was a fine figure, long and lean —6 ft. of wire and whipcord—black-haired and swarthy as a gipsy; he was always cheery, a good mixer, with an unending fund of stories. As a student he won honours as a boxer, and in 1885 was amateur champion bicyclist at various distances. In later years he was a keen golfer and a devoted motorist. 'Furni' was a fine surgeon, with a quick brain; a fearless operator but careful and thorough in every detail. Furnivall said what he meant bluntly and meant what he said; he was a good friend, the most loyal of colleagues, an awkward opponent, and one of the worst correspondents in the world. He was an omnivorous reader and a connoisseur of the good things of life. Recurring bronchial catarrh prevented overseas war service and eventually drove him into retirement in Devon, whence of late years he fled to warmer climates for the winter months. Furnivall was ever a man of action and I doubt if he appreciated the comparative calm of retirement. I visited him on several occasions and in 1931 we met unexpectedly in New Zealand. While in Jamaica in February, 1937, he developed an epithelioma of his left tonsil and with characteristic energy left for New York at once, where he underwent treatment by operation, X rays, and radium. All went well until his return home where in July he began to suffer most painful and distressing after-effects of treatment, graphically described in a memorandum published in the *British Medical Journal* in February last. This letter excited widespread interest and initiated a correspondence which has only just come to an end. In his last letter to me, dated March 1st, 1938, he wrote: 'I've had a grim year but I mean to make the gradient.' But he just missed it. He was a grand fighter, and we could do with more of his type to-day."

THE LATE DR. GRABHAM

Dr. Michael Grabham, whose death we announced on April 23rd, was born in Madeira in 1866, the son of Michael Grabham, M.D., and Mary Anne Blandy. He was educated at University College School, London, and St. John's College, Cambridge, where he was an exhibitioner. Having taken a first in the natural sciences tripos, he went to St. Thomas's Hospital, qualified in 1891, and entered the government medical service in Jamaica. For the next 38 years he had charge of the Victoria Jubilee Lying-in Hospital at Kingston; he was made secretary for the Medical Council in 1894, served on the commission on Cattle Diseases (1895) and the Malaria Commission (1908), received the thanks of the government for his work in the earthquake of 1907, and retired in 1929. His special interests were in tropical diseases and in obstetrics; during his term of office at the Victoria Jubilee Hospital more than 400 maternity nurses were trained for the colony. He contributed many notes and much material to the Carnegie Institution in Washington, which were incorporated in "The Mosquitoes of North and Central America and the West Indies," published by that institution in 1915. After the great earthquake he received a cable inquiring for the safety, not of himself but of his collection of mosquitoes, suggesting that it was too valuable to leave in an earthquake

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zone. A genus of more than 40 species of mosquitoes bears his name.

After retiring, Dr. Grabham left Jamaica and returned to his old home in Madeira, where his father remained until his death three years ago. He took great pleasure in botanical work and published in 1934 "Plants Seen in Madeira." Another book on the Madeira flora is now in the press, and his large collection of island plants and grasses has been presented to the new museum at Funchal.

Dr. EDWARD GAVED STOCKER, who died on April 28th at Grampound-road, Cornwall, was the son of Thomas Stocker of St. Austell, and born there in 1862. He was educated at Caversham and University College and at St. Bartholomew's Hospital, where he won an open scholarship in science. After holding house appointments at the West London Hospital he settled in practice at Clevedon, becoming medical officer to the hospital there and surgeon-captain to the 2nd Wessex Field Company, R.E. In the late war he first served with a Wessex division of engineers, and later was in medical charge of Wiltshire military hospitals, ending up as embarkation medical officer at Plymouth. Dr. Stocker had many interests in the west country, its history and welfare, and his favourite recreations were hunting, motoring, and golf.

Lieut.-Colonel HERBERT JAMES WALTON, I.M.S. (retd.), qualified from St. Bartholomew's Hospital in 1893, going on to take the highest honours at London University. At Netley he gained the first Montefiore prize for military surgery and the Martin medal for military medicine. Entering the Indian Medical Service in July, 1896, he was in military employ until 1905, when he became civil surgeon, United Provinces. Meanwhile his war services had brought him medals for the Frontier of India (1897–98), China (1900), and Tibet (1903–04). In 1913–14 he held the chair of pathology at King George's Medical College, Lucknow, reverting to military duty in April, 1915. He died at Godalming on May 4th.

PANEL AND CONTRACT PRACTICE

Post-graduate Study

FORTY-ONE insurance practitioners have now completed refresher courses at the Royal Northern Hospital, London, and at the University of Leeds under the Ministry of Health's scheme. Courses for a further 40 doctors are in progress at Liverpool University and at the Nottingham General Hospital and 61 doctors began similar courses on Monday last at the University of Birmingham and at the British Post-graduate Medical School, Hammersmith, where a continuous series of courses is being provided. Bristol, Cambridge, Newcastle, Oxford, and Sheffield will also take part. By arrangement with the Department of Health for Scotland 35 English doctors will take courses at Scottish centres and a corresponding number of Scottish doctors at Hammersmith. In all about 850 English insurance practitioners will take part this year.

Lavish Prescribing

Two partners had their prescribing for the first quarter of 1937 investigated by the panel committee, at the instance of the Ministry of Health. The committee came to the conclusion that the practitioners' prescribing showed evidence of excess, estimated (after making every possible allowance) at not less than £25. The practitioners appealed to the Ministry against this decision but their appeal was dismissed. During the period under review the two partners issued 7217 prescriptions to 1420 patients, the mean number of patients on their lists being 2886. The average cost per person and the average number of prescriptions per person were 74 per cent. and 67 per cent. respectively above the areal averages. The total cost of the 7217 prescriptions was £248 0*s.* 8*d.*; on the areal average it would have been £141 17*s.* 11*d.* The senior partner appeared, to represent both doctors. The report of the appeal tribunal says that his attitude to the whole proceedings seemed one of polite tolerance; he seemed reluctant to consider any question of economy. The chief factors leading to the high charge on the drug fund were frequency of administration and frequency of prescribing.

Both partners showed a bias towards ordering medicine every four hours, 56 per cent. of the mixtures bearing this signature. The frequency of this instruction for the whole of England all the year round is 14 per cent. Naturally, however, the ratio is greater in the winter than in the summer months because of the prevalence of respiratory catarrhs. To test the frequency of prescribing comparable figures were put in from four neighbouring practices, two of which were admitted by the senior partner to be comparable with his own. In these two practices 48 per cent. of the panel list were prescribed for during this quarter, a figure only just below that of the practice concerned (49 per cent.). The number of prescriptions issued per patient, however, was only 4·01 as against 5·08 in this case (the mean for the whole county was 3·61). The senior partner took exception to the fact that each prescription on a form was counted as a unit, but as this method was applied to the controls the objection was held to be invalid. The number of prescriptions per person on the prescribing list was 2·15 in comparison with 1·92 for his neighbours. Of the total number of scripts 65 per cent. contained more than one prescription, as compared with a mean for the whole country of 25 per cent. The report continues:

A study of the actual scripts reveals a certain lavishness of prescribing irrespective of the time elapsing between consecutive prescriptions. The use of proprietary articles accounted for 15·96 per cent. of the total ingredient cost as compared with 4·5 per cent. for England as a whole. Elastoplast bandages for five patients (47 bandages) cost £5 17*s.* 6*d.*, a figure which seemed inexplicable till the senior partner told us that his habit was to replace the bandage every week over considerable periods. The same patients at the same time were given a large amount of lotions and dressings (generally half a pound of plain lint). In the opinion of the referees such frequent changes are quite unnecessary, and detract from the efficiency of the treatment whether considered from practical or theoretical grounds.

The insurance committee decided to recommend the Minister to withhold £25 from the practitioners' remuneration.

Dr. J. C. W. Methven has been appointed a commissioner of prisons in the place of Dr. W. Norwood East, who is retiring.

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PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS

Local Authorities and the Blind

IN the House of Commons on May 6th, when the Prevention and Treatment of Blindness (Scotland) Bill was read a third time and passed,

Mr. ALLAN CHAPMAN moved an amendment providing that any scheme submitted by a local authority should be subject to the approval of the Department for Health for Scotland. The purpose of this was to ensure that any conditions the authority laid down which might be considered inexpedient were eliminated at the source and before the scheme came into operation. In seconding the amendment,

Mr. GARRO-JONES said that the Bill entitled local authorities to take such measures as they thought would assist in the prevention of blindness. It had been pointed out that those words did not mean what they said, but this argument had been brought to nought by evidence that some local authorities acting in advance of the statute had interpreted the provisions in the Bill as much wider than they were intended to be, and had, in fact, sought to bring pressure, or at any rate invested themselves with power to bring pressure, upon blind persons in order to prevent their marriage if the medical officer of health thought it would be undesirable. In view of this evidence an undertaking had been given that the matter would be brought within the purview of the Secretary of State for Scotland.

Better Rural Housing

The support of county medical officers of health for the rural housing Acts was expressed by Sir Francis Fremantle during the debate on the second reading of the Housing (Rural Workers) Amendment Bill on May 9th. Sir Kingsley Wood had said he would ask district councils to ascertain themselves what cottages needed reconditioning, and where the owners were unwilling to do the work, to consider exercising their powers to buy the cottages and themselves recondition them. Sir Francis thought there was a danger that local authorities might make grants for keeping alive and reconditioning houses which were not worthy to be reconditioned. The county medical officers of health, through their association, were, he said, strongly in favour of this Bill, but they were anxious that much more control should be exercised. The M.O.H. for Devon had reported well of the working of the Acts in his county. There were many good houses, built in the middle of the last century, which were quite capable of being improved.

Insanity and Marriage

During the second-reading debate on the Administration of Justice (Miscellaneous Provisions) Bill, which has passed through the House of Lords, Mr. A. P. HERBERT referred to the position of doctors when certifying insanity in connexion with matrimonial causes. Complaint was being made that in the administration of the Matrimonial Causes Act passed last year the intentions of Parliament were not being carried out. The first point was with regard to the provision which gave a right to sue for a dissolution of marriage where the co-respondent had been of unsound mind for five years. During debate last year a great deal was heard about the possibility of a doctor being able to say that a person was incurably insane. But now the British Medical Association had raised two new points. Their council had considered the ethical position of the medical man, in charge of an insane patient, approached for an opinion by a prospective petitioner; they were advised that any opinion as to the patient being of unsound mind would not be covered by the protection given under the Mental Treatment Act or the Lunacy Act; and that the safest course would be for the practitioner to decline to express any opinion save by direction of the court, although he might place his records at the disposal of an independent medical expert nominated by the petitioner. The B.M.A. council considered that the medical man responsible for the care of the patient would not be justified in giving an opinion except at the express direction of the court. The adoption of this attitude would, however, make the Act unworkable. Mr. Herbert's other point was that there were many cases in which husband or wife had been deserted and the magistrate had inserted in the separation order what was called a non-cohabitation clause, with the result that they were not entitled to divorces. He thought the law officers should look into this.

In the House of Commons on May 3rd the Nursing Homes Registration (Scotland) Bill was read a second time.

QUESTION TIME

WEDNESDAY, MAY 4TH

Silicosis Certificates

Mr. ELLIS SMITH asked the Home Secretary the number of applications for certificates from people claiming to be suffering from silicosis; the number granted; the number of applications made for certificates claiming that death was due to silicosis; and the number of certificates granted in the North Staffordshire area of the pottery industry, with separate particulars for each year 1925 to 1938, respectively.—Mr. GEOFFREY LLOYD, Under-Secretary, Home Office, replied: The following table relates to applications from the Pottery Industry (practically all from North Staffordshire) dealt with by the Stoke Panel of the Silicosis Medical Board since June 1st, 1931. The Board did not previously deal with pottery cases, and I regret that earlier figures are not available.

—	Death certificates.		Disablement certificates.	
	Granted.	Refused.	Granted.	Refused.
June–December 1931 ..	17	12	31	45
1932 ..	31	9	90	71
1933 ..	31	9	67	72
1934 ..	30	5	52	48
1935 ..	31	6	65	61
1936 ..	30	6	24	49
1937 ..	42	6	38	47

THURSDAY, MAY 5TH

Lead Poisoning

Mr. HOLLINS asked the Home Secretary whether he was aware that the effect of lead poisoning might not become evident until some years after a worker, who had been employed in a lead process, had left his occupation; and whether he would consider extending the period in which a claim for compensation could be made after a worker had ceased to be employed in a lead process from one year to at least five years or to eliminate the time limit.—Sir SAMUEL HOARE replied: The point will be noted for consideration when an opportunity occurs for amending legislation, and if the hon. Member will send me particulars of any cases he has in mind I shall be glad to consider them.

Chronic Invalids and Voting Facilities

Rear-Admiral BEAMISH asked the Home Secretary whether he would make arrangements whereby facilities might be afforded to chronic invalids to record their votes at parliamentary elections on lines similar to those accorded to absent voters.—Sir SAMUEL HOARE replied: Legislation would be necessary to give effect to my hon. friend's proposal. The proposal is not free from difficulty, but it has been noted for consideration when opportunity arises.—Rear-Admiral BEAMISH: Does the right hon. gentleman realise that such a concession would be a great boon to a large number of intelligent citizens? Is it not a principle which already obtains in this House in regard to recording votes of hon. Members who are

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blind, or who are chronic invalids?—Sir S. HOARE: That may be so, but this proposal administratively is not free from difficulty. It will be kept in mind in any legislation dealing with the subject.

Cesspools and Public Health

Mr. LIDDALL asked the Minister of Health whether he was aware that the provisions of Section 37 of the Public Health Act, 1936, perpetuated the system of cesspools by withholding from a local authority the power to reject building plans of dwelling-houses on unsewered land solely on account of proposed cesspools; and whether he would consider providing regulations to prohibit the building of cesspools for any dwelling-house within an urban district.—Sir KINGSLEY WOOD replied: The Public Health Act, 1936, gives, I am advised, ample powers to local authorities to secure the proper construction and maintenance of cesspools and to prevent their being a nuisance or prejudicial to health.—Mr. LIDDALL: Does not my right hon. friend consider that the Public Health Act should give local authorities the power to reject plans solely on the ground of the provisions of a cesspool? Does he consider that in 1938 it is right that dwelling-houses in urban districts should have cesspools?—Sir K. WOOD: I think this would be a very difficult proposition to accept.

MONDAY, MAY 9TH

Milk Schemes

Mr. RIDLEY asked the Minister of Agriculture what had been the increased consumption of milk in the families participating in the special milk schemes in the areas in which they were at present operating.—Mr. MORRISON replied: I am informed by the Milk Marketing Board that there has been an average increase of 0·13 pint, or 61 per cent., in the daily per capita consumption of milk in families participating in the experimental schemes for the supply of cheap milk to nursing mothers and children under five years of age in the Special Areas.

Maternal Welfare

Miss WARD asked the Minister of Health how many local authorities in the Special Areas failed to provide, where necessary, additional nourishment to expectant mothers at all stages of pregnancy.—Sir KINGSLEY WOOD replied: All the 35 authorities responsible for maternity and child welfare services in the Special Areas supply additional nourishment in the form of milk to expectant mothers, and all but 5 of them do so at all stages of pregnancy. 22 of the 35 authorities supply other forms of additional nourishment to mothers, the great majority at all stages of pregnancy. In addition the scheme introduced by the National Birthday Trust Fund for providing other additional food for certain groups of expectant mothers is in operation in most of the Special Areas.

Nursing Services Committee

Sir ARNOLD WILSON asked the Minister of Health whether the decision not to print the minutes of evidence of the Departmental Committee on Nursing was taken by the chairman of the committee or on instructions from the Treasury, and on what grounds.—Sir KINGSLEY WOOD replied: No decision has yet been taken as to the publication of the evidence given before this committee.

Ventilation of the House

Mr. DAY asked the First Commissioner of Works whether, in view of the repeated representations that his department has received in the past to the effect that the existing system of ventilation in the Chamber was prejudicial to health, he would now undertake to have the necessary alterations made for the improvement of the same.—Sir P. SASSOON said that although admittedly the present system left something to be desired from the point of view of comfort during the summer months, the results of exhaustive study of the conditions in the Chamber, together with the advice which he had received from various expert authorities, pointed to the conclusion that the conditions were in no way prejudicial to health. Much careful study had been given to an improved ventilation scheme, but in view of the heavy demands at present being made by the defence programme on the engineering industry it was desirable to keep this scheme and others of a comparable character in reserve for consideration when the peak of the armament programme had been passed and when it would be both more advantageous and more opportune for the industry to have ordinary civil works available for execution.—Mr. CROSSLEY: What can this really have to do with rearmament? Why should Members be kept for years longer in a thoroughly lethargic and dull atmosphere?

Prison Officers' Sick Leave

Mr. GRAHAM WHITE asked the Secretary of State for the Home Department if he would indicate the average number of days sick leave taken by prison officers, principal officers, and chief officers in His Majesty's prisons during the last 12 months for which statistics were available; and if he would further indicate the maladies from which officers of these grades most frequently suffered, as disclosed by returns in the possession of his department.—Sir SAMUEL HOARE replied: The average number of days sick leave taken by prison officers during the year 1937 is as follows:—

Men.			Women.		
Officers	9·2	8·7	Officers	10·0	9·6
Principal officers	7·6		Principal officers	9·6	
Chief officers	5·2		Matrons	4·4	
Foremen of works and engineers	4·0		Chief officers	10·0	

I regret that the information asked for in the last part of the question is not available and could not be obtained without an unjustifiable expenditure of time and money.

Diphtheria Deaths

Sir ARNOLD WILSON asked the Minister of Health the total number of deaths from diphtheria in England and Wales between the ages of 0–15 for each of the years 1933 to 1936, and the death-rate per thousand children living between those ages.—Sir KINGSLEY WOOD replied: The following is the information desired:—

—	Diphtheria—England and Wales.	
	Deaths of children under 15 years of age.	Death-rate per 1000 children living under 15 years of age.
1933 ..	2487	0·261
1934 ..	3826	0·402
1935 ..	3256	0·351
1936 ..	2884	0·318

Purity Standard for Jam

Mr. BANFIELD asked the Minister of Health whether he was aware that there was no legal standard of content and purity for jam; that recently public analysts of Birmingham, Leicester, and in Lancashire had commented adversely upon the existing situation; and that adulteration and misdescription was common throughout the country; and whether he would consider introducing legislation to establish the standard for jam agreed upon between the Food Manufacturers Association and the Society of Public Analysts.—Sir KINGSLEY WOOD replied: I would refer the hon. Member to Clause 81 (c) of the Food and Drugs Bill at present before Parliament under which it is proposed to enable regulations to be made dealing amongst other things with the matter in question.

Incident at Birmingham Mental Home

Mr. RHYS DAVIES asked the Minister of Health whether his attention had been drawn to the case of a Birmingham mental home in which two drunken attendants were fined for attacking and beating an inmate while a third stood by and encouraged them; and whether he would called for a report on the conduct of that institution.—Sir KINGSLEY WOOD replied: Yes, Sir, the prosecution in this case was instituted at the instance of the Board of Control, the persons in question having previously been instantly dismissed. I have had before me a report made by two Commissioners of the Board who inspected the

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Institution on March 23rd and 24th. They reported favourably upon its administration and upon the care and treatment of the patients.

Bombing of League Anti-epidemic Unit

Mr. NOEL-BAKER asked the Prime Minister if he could make a statement concerning the recent bombing of a League of Nations hospital by Japanese aircraft.—Mr. BUTLER, Under-Secretary for Foreign Affairs, replied: I understand that during a Japanese air raid on Hankow on April 29th the Hankow branch of the League's English-speaking anti-epidemic unit was destroyed, and that two of the Chinese members of the unit were killed.

Milk Schemes in Special Areas

Mr. RIDLEY asked the Minister of Agriculture (1) whether it was proposed to extend the special milk schemes for mothers and children under five years of age to areas other than those in which they were at present operating, and (2) whether it was proposed to extend the special milk schemes now operating in the Rhondda, Jarrow, and other similar areas, beyond the date at present fixed for their termination.—Mr. MORRISON replied: I understand that the Milk Marketing Board do not, at present, contemplate any extension of their experimental schemes in the Special Areas, but as was stated in the White Paper on Milk Policy, the Government propose to bring forward proposals for securing, in coöperation with the industry, a reduction in the price of liquid milk to local authorities generally for the purpose of their maternity and child welfare arrangements.

Mr. RIDLEY asked the Minister of Agriculture what proportion of those entitled to participate in the various special milk schemes at present operating in the Rhondda, Jarrow, and other similar areas, had availed themselves of them.—Mr. MORRISON replied: I am informed by the Milk Marketing Board that, of the persons eligible to participate in the four experimental schemes for the supply of cheap milk to nursing mothers and children under five years of age in the Special Areas, the proportions that have availed themselves of the facilities vary between 60 per cent. in Jarrow and 65 per cent. in Whitehaven.

MEDICAL NEWS

Research in Tropical Medicine

The Medical Research Council, advised by their tropical medical research committee which was appointed after consultation with the Colonial Office, have decided to offer three junior fellowships to medical men who wish to receive training for research work in tropical medicine. Preference will be given to candidates who have already had preliminary experience of methods of research in some branch of medical science. Subject to satisfactory reports, the fellowships will be tenable for three years. The first year will be spent at a school of tropical medicine; the second in doing research in the same or some other institution at home; and the third largely in work under direction at some centre in the tropics. The stipend will be at the rates of £300, £400, and £500 per annum in the successive years, with an additional allowance during service abroad and necessary expenses. In three years' time at least one senior fellowship will be available for candidates who have held the junior fellowships mentioned above. This will be awarded for a further period of three years, carrying stipend at the rate of £600–£750 per annum, with an additional allowance during service abroad and expenses. The time will be spent mainly in research work in the tropics. The council are also prepared to consider immediate applications for senior fellowships from candidates who have had adequate experience in research work, whether already specially trained in tropical medicine or not.

The council further intend to establish in due course, as suitable investigators become available as the result of the fellowship scheme, permanent and pensionable appointment for research work in tropical medicine, including senior posts. Members of this research staff will work partly in the tropics and partly in institutions at home to which they will be attached. The exact terms of service are still undecided, but they will be not less favourable than those which apply to other Government appointments at home or overseas for men of similar professional standing. Inquiries may be addressed to the secretary of the Tropical Medical Research Committee, 38, Old Queen-street, London, S.W.1, with whom applications should be lodged not later than June 16th.

Plastic Surgery Congress

An International Plastic Surgery Congress will be held at the Sarfatti Institute in Milan from Sept. 25th to 27th.

Physical Fitness in Prague

Sokols, members of Czechoslovakia's national athletic organisation, will hold their tenth six-yearly "slet" or assembly in Prague during July. The association, which is voluntary, was started in 1862 and is organised in 3265 local sections. It owns over a thousand gymnasiums and over 2100 playing-fields. It is expected that 120,000 athletes will take part in this year's display. Arrangements to attend the meeting can be made through Messrs. Thos. Cook and Son, Berkeley-street, London, W.1.

University of London

Prof. W. Girling Ball and Dr. A. M. H. Gray have been reappointed to the senate as representatives of the faculty of medicine, and Prof. L. S. Dudgeon as representative of the general medical schools.

University of Birmingham

Among those on whom the university will confer the honorary degree of LL.D. on July 2nd are Dr. Robert Hutchison, P.R.C.P., Sir Cuthbert Wallace, P.R.C.S., and Sir Edward Mellanby, F.R.S. The degrees are being conferred to mark the completion of the Hospitals Centre and the new medical school which is being opened by the King and Queen on July 14th.

An intensive course in industrial hygiene and medicine will be held at this university from Sept. 12th to 23rd. The syllabus includes the following subjects: non-occupational diseases in industry; factory ventilation, lighting, and sanitation; industrial skin diseases; lead poisoning in modern industry; the metallic poisonings; organic toxins and solvents; the dust diseases; industrial eye diseases; fatigue and practical psychology in the factory; mine fumes, safety appliances, and rescue work; the organisation of a works medical service; and medico-legal problems. Further information may be had from Dr. H. E. Collier, the department of industrial hygiene and medicine, the University, Edmund-street, Birmingham.

Royal Medico-Psychological Association

The annual meeting of this association will be held at Ilkley, Yorkshire, on July 6th, 7th, and 8th.

Kathleen Schlesinger Research Fellowship

The Medical Research Council have appointed Dr. Karl Stern to this fellowship for the year 1938-39. It is provided from a fund established by the late Mr. Eugen M. Schlesinger and Mrs. Schlesinger in memory of their daughter: it is given for investigations of cysts of the brain or allied conditions, and is ordinarily tenable at the National Hospital for Diseases of the Nervous System, Queen-square, London.

St. Mark's Hospital, London

On May 5th the Princess Royal visited this hospital to open the nurses' home, which is the first stage in an extension scheme. The Lord Mayor, president of the hospital, said that the home had been built because the hospital committee recognised that everything possible should be done to ensure the comfort and well-being of those who ministered to the patients. The home provided a separate bedroom for each nurse, three sitting-rooms, a large recreation room overlooking the garden court, and a room in which nurses can entertain their visitors. When the hospital began its work in 1835 the total number of patients was only 131; in 1937 there were 1003 in-patients and 11,000 out-patients. Approximately £25,000 was still required to cover the cost of the nurses' home and the reconstruction and extensions now to be put in hand.

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Royal Statistical Society

A meeting of this society will be held in the hall of the Royal Society of Arts, John-street, Adelphi, London, W.C., at 5.15 P.M. on Tuesday, May 17th, when Dr. Percy Stocks will read a paper on the effects of occupation and of its accompanying environment on mortality.

West London Medico-Chirurgical Society

Sir William Willcox will deliver the Cavendish lecture to this society on Wednesday, June 1st, at 8.30 P.M., at Kensington town hall. He will speak on toxicology with reference to its criminal aspects. The annual conversazione and medical and surgical exhibition will take place after the lecture.

Royal Medical Benevolent Fund

At a recent meeting of the committee three annuitants were elected, and thirty-eight beneficiaries were awarded grants. Eleven of these were new applicants. The following are particulars of three cases:—

Widow, aged 64, of M.R.C.S. who died in 1916 at the age of 42. The widow has had a salaried post in social work for many years but owing to the closing down of the association lost her employment in December, 1937, and now finds it impossible to get fresh employment. Her two children, aged 34 and 30, are unable to contribute to her support. Fund voted an allowance at the rate of £1 a week for six months and is seeking the coöperation of other charitable societies.

Daughter, aged 60, of M.R.C.S. who in died 1914 at the age of 76. The daughter has helped her mother to run a boarding-house since 1914 and they have just managed to maintain themselves. The mother is now 83 and all work falls on the daughter who does the cooking as well as looking after her mother. For years she has had a hard life and a struggle to make two ends meet, with no money for extras or a holiday. Fund voted £20 to enable the daughter to have a holiday and rest.

Widow, aged 66, of L.S.A. who died in 1915 at the age of 52. Has invalid daughter aged 32. The widow supported herself and educated her daughter by successfully running a boarding-house until 1933, when circumstances forced her to give up. Recently she has suffered from a duodenal ulcer which has necessitated nursing-home treatment. Her own and her daughter's illnesses have been a great drain on her resources and the money which she had put aside has been used up. Only income now £60—invalid daughter is able to earn a little by teaching painting £26 per annum. Fund voted an allowance at the rate of £1 a week for six months, when the case will be reviewed.

New annual subscribers are urgently needed by the fund. Cheques may be sent to the hon. treasurer of the fund, 11, Chandos-street, London, W.1.

Medical Diary

May 16th to May 22nd

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
TUESDAY.
5 P.M., meeting of fellows.
THURSDAY.
Dermatology. 5 P.M. (cases at 4 P.M.), annual general meeting. Dr. H. MacCormac: (1–2) Atrophic Lichen Planus in Women. Dr. H. Semon: (3) Benign Lymphogranulomatosis (Schaumann). Dr. Sydney Thomson: (4) Congenital Cutis Verticis Gyrata. (5) Leiomyomas. Dr. A. M. H. Gray: (6) Sarcoma of the Skin. (7) Urticaria Pigmentosa. (8) Acneiform Lesions in a Child. Dr. Godfrey Bamber: (9) Rosaceous Tuberculide.
Neurology. 9 P.M., annual general meeting. Prof. Georges Guillain (Paris): "Le syndrome myoclonique rythmé vélo-pharyngo-oculo-diaphragmatique."
FRIDAY.
Obstetrics and Gynæcology. 8 P.M., annual general meeting. Mr. Victor Bonney: Erythroblastosis Fœtalis; and Leucoplakic Vulvitis and the States that Mimic It. Mr. Kenneth Walker and Mr. B. P. Wiesner, Ph.D.: Male Sterility and the Assessment of Male Fertility. Mr. James Wyatt: Femoral Thrombosis.
Radiology. 7 P.M., annual general meeting.

ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION.
FRIDAY.—2.30 P.M. (11, Chandos-street, W.), discussion on the Alleged Inadequacy in Numbers of Medical Officers in Mental Hospitals.
Pathological, Bacteriological and Biochemical Subcommittee.
THURSDAY.—8 P.M. (Central Pathological Laboratory, Denmark-hill, S.E.), Dr. D. N. Parfitt: The Uses of T.A.B. Vaccine in Psychiatry. Dr. W. M. Ford-Robertson: Leucocyte Activity in the Manic-depressive Psychosis.

BRITISH INSTITUTE OF RADIOLOGY, 32, Welbeck-street, W.
THURSDAY.—6.30 P.M., annual general meeting.

Medical Meeting,
FRIDAY.—11 A.M., visits to the British Red Cross Society's Clinic for Rheumatism, Peto-place, N.W. 5.30 P.M., case demonstration and discussion.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, Manson House, 26, Portland-place, W.
THURSDAY.—8.15 P.M., Dr. P. C. C. Garnham: The Placenta in Malaria with special reference to Reticulo-endothelial Immunity. Major H. W. Mulligan will open the discussion.

TUBERCULOSIS ASSOCIATION.
FRIDAY.—5.15 P.M. (26, Portland-place, W.), Dr. J. Browning Alexander, and Dr. G. J. Johnston and Mr. C. A. Collingwood: Trauma and Tuberculosis. 8.15 P.M., Dr. J. T. Hunter and Mr. J. B. Hunter: Anæsthetics in Thoracic Surgery.

SOCIETY OF RADIOTHERAPISTS OF GREAT BRITAIN AND IRELAND.
FRIDAY.—5 P.M. (Middlesex Hospital, W.), Prof. Hugh Cairns, Mrs. E. L. G. Hilton, and Dr. Robert McWhirter: Radiotherapy of Brain Tumours.

NORTH LONDON MEDICAL AND CHIRURGICAL SOCIETY.
FRIDAY.—9.15 P.M. (Royal Northern Hospital, Holloway-road, N.), Dr. James Maxwell: Acute Infections of the Lung. (Presidential address.)

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane-road, W.
TUESDAY.—4.30 P.M., Dr. Gardiner-Hill: Diseases of the Ductless Glands.
WEDNESDAY.—Noon, clinical and pathological conference (medical). 2 P.M., Mr. E. J. King, Ph.D.: Acid-base Metabolism. 3 P.M., clinical and pathological conference (surgical).
THURSDAY.—2.15 P.M., Dr. Duncan White: radiological demonstration. 3.30 P.M., Mr. Aleck Bourne: Salpingitis.
FRIDAY.—2 P.M., clinical and pathological conference (obstetrics and gynæcology).
Daily, 10 A.M. to 4 P.M., medical clinics, surgical clinics and operations, obstetrical and gynæcological clinics and operations.

ST. GEORGE'S HOSPITAL, S.W.
THURSDAY.— 5 P.M., Dr. A. J. Lewis: Psychiatric demonstration.

LONDON SCHOOL OF DERMATOLOGY, 5, Lisle-street, W.C.
MONDAY.—5 P.M., Dr. H. MacCormac: Treatment of Syphilis.
TUESDAY.—5 P.M., Dr. Mitchell Heggs: Skin Affections of the Hands and Feet.
WEDNESDAY.—5 P.M., Dr. I. Muende: Pathological Demonstration.
FRIDAY.—5 P.M., Dr. L. Forman: Alopecia.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY.—2 P.M., Mr. Denis Browne: Treatment of Empyema. 3 P.M., Dr. D. G. Edwards: When Does a Blood Count Aid Diagnosis?
Out-patient clinics daily at 10 A.M. and ward visits at 2 P.M.

ST. MARY'S HOSPITAL, W.
TUESDAY.—5 P.M. (Institute of Pathology and Research), Prof. John Mellanby, F.R.S.: Bile Salts as the Dominant Factor in Intestinal Secretions and Digestion.

NATIONAL HOSPITAL FOR DISEASES OF THE HEART, Westmoreland-street, W.
TUESDAY.—5.30 P.M., Dr. D. Evan Bedford: Hypertensive Heart Disease.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY to SUNDAY.—BROMPTON HOSPITAL, S.W., all-day course in thoracic surgery.—ST. JOHN CLINIC AND INSTITUTE OF PHYSICAL MEDICINE, Ranelagh-road, S.W., Sat. and Sun. course in physical medicine.—MAUDSLEY HOSPITAL, Denmark-hill, S.E., afternoon course in psychological medicine.—ST. JOHN'S HOSPITAL, 5, Lisle-street, W.C., afternoon course in dermatology. (Open to non-members.)

MANCHESTER ROYAL INFIRMARY.
FRIDAY.—4.15 P.M., Dr. Charles Don: clinical demonstration.

Vacancies

For further information refer to the advertisement columns

Accrington, Victoria Hosp.—H.S., £175.
Barking Borough.—Asst. M.O., £600.
Birmingham City, Mental Hosp. Dept.—Jun. Asst. M.O., £350.
Birmingham, Queen's Hosp.—Res. Surg. Reg., £125.
Birmingham and Midland Eye Hosp.—H.S., at rate of £130.
Blackburn County Borough.—Asst. M.O.H. and Asst. School M.O., £600.
Bolton Education Committee.—Asst. M.O.H. and Asst. School M.O., £500.
Bolton Royal Infirmary.—Asst. Res. Surg. O. and H.P., each at rate of £200. Also three H.S.'s, each £150.
Boston General Hosp.—Res. M.O., at rate of £150.
Brighton, Royal Sussex County Hosp.—H.P., £150.
Bristol, Winford Orthopædic and Heart Hosp.—M.O., £325.
Bury County Borough.—Asst. M.O.H., £500.
Cairo, Memorial Ophthalmic Laboratory.—Pathologist and Bacteriologist, £E.1200.
Canterbury, Kent and Canterbury Hosp.—Hon. Physician.
Cardiff, King Edward VII Welsh National Memorial Association. Asst. Res. M.O. for North Wales Sanatorium, £200.
Central London Throat, Nose, and Ear Hosp., Gray's Inn-road, W.C.—Third Res. H.S., at rate of £75.
Central Middlesex County Hosp., Acton-lane, Willesden, N.W.—Pathologist, £1100. Also Res. Asst. M.O., £400.
Chester, Barrowmore Tuberculosis Sanatorium and Settlement.—Jun. Asst. M.O., at rate of £200.
Coventry City.—Asst. School M.O., &c., £500.

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Derbyshire County Sanatorium.—Jun. Res. Asst. M.O., £350.
Dreadnought Hosp., Greenwich, S.E.—Receiving Room Officer, at rate of £100.
Edgware, Redhill County Hosp.—Obstetric Surgeon, £500.
Evelina Hosp. for Sick Children, Southwark, S.E.—H.P., at rate of £120.
Gloucestershire County Council.—Two Asst. County M.O.H.'s, each £500.
Gravesend and North Kent Hosp.—Jun. H.S., £120.
Halifax Royal Infirmary.—Second H.S. to Eye, Ear, Nose, and Throat and Medical Depts., at rate of £175.
Hampstead General and North-West London Hosp., Haverstock Hill, N.W.—Res. Cas. Surg. O., at rate of £100.
Harefield, County (Tuberculosis) Sanatorium.—Jun. Res. Asst. M.O., at rate of £250.
Hastings, Royal East Sussex Hosp.—Asst. Pathologist, £300. Also Hon. Surgeon.
Hertford County Hosp.—H.S., at rate of £200.
Heston and Isleworth Borough.—M.O.H. and School M.O., £1000. Also Asst. M.O.H. and School M.O., £500.
His Majesty's Colonial Service.—Bacteriologist for Veterinary Dept. in Kenya, £500.
Home Office.—Three Medical Inspectors of Factories, each £750.
Hornsey Central Hosp., Park-road, N.—Hon. Radiologist.
Hosp. for Consumption, &c., Brompton, S.W.—Res. M.O., £350.
Hosp. for Sick Children, Great Ormond-street, W.C.—Asst. Res. Surg. O., £100. Also two Res. H.P.'s and Res. H.S., each at rate of £50.
Huddersfield Royal Infirmary.—H.S. to Eye, Ear, Nose, and Throat Depts., at rate of £150.
Hull City Hosp. for Infectious Diseases, Cottingham.—Res. M.O., £350.
Hull Royal Infirmary.—Second Cas. O., at rate of £150.
Hull and Sculcoates Dispensary.—Res. M.O., £550.
Infants Hosp., Vincent-square, S.W.—Hon. Surgeon. Also Clin. Assts. to Out-patient Dept.
Ipswich Isolation Hosp.—Asst. M.O.H., &c., £450.
Isleworth, West Middlesex County Hosp.—Asst. M.O., £400.
Kettering and District General Hosp.—H.P., £150.
Lancashire Mental Deficiency Acts Committee.—Additional Asst. M.O., £550.
Lancaster Royal Infirmary.—H.S., at rate of £130.
Leeds City.—Asst. M.O. for Maternity and Child Welfare, £500.
Leicester Royal Infirmary.—Res. Radiologist, at rate of £200.
Lincoln County Hosp.—Jun. H.S., at rate of £150.
Liverpool Convalescent Home, Woolton.—Lady Supt.
Liverpool Heart Hosp.—H.P., at rate of £100.
Liverpool Hosp. for Consumption and Diseases of the Chest.—Med. Supt. for Delamere Sanatorium, £800.
London County Council.—First Asst. M.O., £750. Asst. M.O.'s, Grade I, £350. Asst. District M.O.'s, £280 and £125. Consultant and Specialist Services: Part-time Ear, Nose, and Throat Specialist, £200. Also Organiser of School Meals, £300.
London Homœopathic Hosp., Great Ormond-street, W.C.—Res. H.P., Res. H.S., and Res. Med. and Cas. O., each at rate of £100. Also Two Hon. Clin. Assts. for Manipulative Surgery.
London Jewish Hosp., Stepney Green, E.—Res. M.O., and H.P., each at rate of £150. Also H.S. and Cas. O., each at rate of £100.
London University, King's College.—Demonstrator in Physiology, £100 per term.
Maidstone, West Kent General Hosp.—H.S., £175.
Manchester, Ancoats Hosp.—Orthopædic Registrar, £50.
Manchester Royal Children's Hosp.—Res. M.O., at rate of £150.
Manchester Royal Eye Hosp.—Out-patient M.O., £200.
Manchester Royal Infirmary.—Res. Jun. M.O. for Barnes Convalescent Hosp., at rate of £150.
Manchester, St. Mary's Hosps.—Res. Obstet. Officer, £150. Also two H.S.'s, each at rate of £50.
Manchester University.—Asst. Lecturer in Chemical Pathology, £400.
Marie Curie Hosp., 2, Fitzjohn's-avenue, N.W.—Res. M.O., £100.
Metropolitan Hosp., Kingsland-road, E.—Cas. O. and Res. Anæsthetist, £100.
Müller General Hosp., Greenwich-road, S.E.—Cas. O. and H.S., at rate of £150 and £100 respectively.
North Middlesex County Hosp., Silver-street, N.—Jun. Res. Asst. M.O., at rate of £250.
Norwich, Norfolk and Norwich Hosp.—H.P., £120.
Nottingham General Dispensary.—Res. M.O., £300.
Nottingham General Hosp.—H.P., at rate of £150.
Oldham, Municipal Hosp.—Res. Asst. M.O., at rate of £200.
Oswestry, Robert Jones and Agnes Hunt Orthopædic Hosp.—H.S., at rate of £200.
Oxford, Radcliffe Infirmary.—Hon. Physician to Dept. of Physical Medicine.
Plymouth, Prince of Wales's Hosp., Greenbank-road.—Res. Surg. O., at rate of £225.
Prison Commission, Home Office, S.W.—M.O., Class II, £525.
Public Schools Exploring Society.—Hon. Surgeon.
Queen Mary's Hosp. for the East End, Stratford, E.—Appointments, £150–£120.
Reading, Royal Berkshire Hosp.—Asst. Hon. Surgeon.
Royal College of Surgeons of England.—Examiner in Dental Surgery.
Royal Free Hosp., Gray's Inn-road, W.C.—Res. Cas. O., £150. Also In-patient Obstet. Asst. and Second H.P.
Royal Naval Medical Service.—Medical Officers.
Royal Northern Hosp., Holloway.—Gynæcologist in V.D. Dept.
Royal Waterloo Hosp. for Children, &c., S.E.—Hon. Asst. Surgeon. Also H.S., at rate of £100.
St. George's Hosp., S.W.—Res. Anæsthetist, at rate of £100.
Salford City.—Asst. M.O. for V.D. Treatment Centre, £500.
Sheffield Royal Infirmary.—Clin. Asst. to Ophth. Dept., £300. Also Ophth. H.S., at rate of £150.
Society for Relief of Widows and Orphans, 11, Chandos-street, W.—Officers.
Southampton Borough General Hosp.—Asst. Res. M.O., £350.
Southampton Free Eye Hosp.—H.S., at rate of £150.
Southampton, Royal South Hants and Southampton Hosp.—H.P., Res. Anæsthetist, two H.S.'s, and Cas. O., each at rate of £150.
Southend-on-Sea General Hosp.—Cas. O., at rate of £100.
Southern Rhodesia Medical Service.—Government M.O., £600.
Stoke-on-Trent, Burslem, Haywood, and Tunstall War Memorial Hosp.—Res. H.S., at rate of £175.
Uxbridge, Hillingdon County Hosp.—Res. Cas. M.O., at rate of £350.
Virginia Water, Holloway Sanatorium.—Jun. Asst. M.O., £350.
West Bromwich, Hallam Hosp.—H.P., at rate of £200.
West End Hosp. for Nervous Diseases, Gloucester-gate, N.W.—Res. H.P., £125.
West London Hosp., Hammersmith-road, W.—Additional Hon. Reg. for Throat, Nose, and Ear Dept. Also Hon. Clin. Asst. in X Ray (Diagnostic) Dept.
Willesden General Hosp., Harlesden-road, N.W.—Biochemist, at rate of £100.
Windsor, King Edward VII Hosp.—Cas. O., £120.
Wolverhampton Royal Hosp.—Res. Asst. Path. and Res. M.O., £150.
Woolwich and District War Memorial Hosp., Shooters Hill, S.E.—H.P., at rate of £100.
York County Hosp.—Res. Anæsthetist and Second H.S., £150.
York Dispensary.—Two Res. M.O.'s, each £175.
The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Bridlington (York, E.R.), and Cleland (Lanark).

Births, Marriages, and Deaths

BIRTHS

CAREW-SHAW.—On May 6th, at Bentinck-street, W.1, the wife of Mr. E. Carew-Shaw, F.R.C.S.—a son.
EVANS.—On May 3rd, at D.10, Nuffield House, the wife of Dr. Roy Evans, of Epping—a daughter.
PALMER.—On April 24th, in Shillong, Assam, the wife of Dr. G. W. Palmer—a son.
STARKIE.—On May 1st, at Devonshire-place, W.1, the wife of Dr. E. T. W. Starkie—a daughter.

DEATHS

COOKE.—On May 9th, at Tottenham, Francis Henry Cooke, M.R.C.S. Eng., late of Birch, Colchester, aged 74.
HANCOCK.—On May 6th, at a London nursing-home, George Charles Hancock, C.B.E., M.R.C.S. Eng., D.P.H., Barrister-at-Law, aged 70.
HIND.—On May 3rd, at Twickenham, Henry Joseph Hind, M.R.C.S. Eng., L.S.A. Lond., aged 85.
LIVINGSTONE.—On May 9th, at Richmond, Surrey, John Livingstone, M.D., C.M. Edin., T.D., Major, R.A.M.C. (T.).
PORTER.—On May 5th, at Bristol, George Porter, M.D. Edin.
PRIOR.—On May 7th, Edward Symes Prior, M.R.C.S. Eng., of Hampstead Way, N.W.11.
ROBSON.—On May 5th, Robert Boyd Robson, M.B. Aberd., of Seven Kings, aged 65.
SIMPSON.—On May 9th, at Chichester, Frederick Hampson Simpson, M.D. Durh., of Bognor Regis.
STOCKER.—On April 28th, Edward Gaved Stocker, M.R.C.S. Eng. (Major, T.D.), R.A.M.C.
WALTON.—On May 4th, at Godalming, Lieut.-Colonel H. J. Walton, M.D. Lond., F.R.C.S. Eng., I.M.S. (retd.).

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

THE LANCET 100 YEARS AGO

May 12th, 1838, p. 226.

From a leading article.

. . . It is good policy, then, to watch over the health of the Navy: and the seamen have, besides, irrefragable claims on the country, founded on principles of rigorous justice. In time of war they are impressed: the ships are prisons, the captains gaolers; the men are dragged into the service by press-gangs, scourged into obedience by the cat, tied up to the mast, or suspended at the yard-arm, whenever they show the least restiveness under the rein of the greatest despot on the seas. The press-gangs in the late wars supplied the victualling gangs with victims; and foul ships, bad biscuits, putrid beef, raised up mutineers to writhe under the lash, and under a savage captain's eye. The most effectual step in the amelioration of the Royal Navy would be the abolition of Impressment: which would be quite unnecessary if flogging were abolished, the men's health, wants, and comforts attended to, if means of instruction were provided aboard, and the *hope of promotion* were held out to merit among all classes. Men would never undertake voluntarily to eat bad biscuits and bad beef with no hope of ever bettering their condition; but if the circumstances in the Navy were made more inviting than in Merchants' Ships, no dread of fighting, or meeting the foe, would daunt the Mariners of England in War.

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NOTES, COMMENTS, AND ABSTRACTS

PROGRESS IN ELECTRO-ENCEPHALOGRAPHY

THE electro-physiology of the cortex has been slow in developing, partly because of the impossibility in many countries of experimenting on the exposed brain of unæsthetised animals. Kornmüller [1] is almost the only experimenter to work systematically without an anæsthetic; his animals were usually curarised, however, and were therefore not strictly normal. His contention that the various cyto-architectonic fields of an animal's brain possess characteristic electrical rhythms or *Eigenströme* has, indeed, been criticised on several grounds, and recently Marinesco, Sager, and Kreindler [2] have described in a short paper some experiments on rabbits which were neither anæsthetised nor curarised. Their results which, as they point out, cannot be directly compared with those obtained either from other animals or in other experimental conditions, suggest that the whole cortex of the rabbit may have a fundamental electrical rhythm of between 2 and 6 per second ". . . associated with the metabolism of the nerve cells." Upon this rhythm are superimposed the discharges characteristic of the several cyto-architectonic and functional fields, of which these authors can recognise three, corresponding roughly with the visual, tactile, and motor areas. The attitude of Marinesco and his colleagues differs from that of Kornmüller, for they consider that "bio-electric differentiation between the various cyto-architectonic fields cannot be made by their characteristic rhythms but only by their functional activities." The very indefiniteness of this statement may be an advance on Kornmüller's rigid dogma of *Eigenströme*.

With the physiological basis still surrounded by the scaffolding of controversy, the structure of clinical electro-encephalography must still be regarded as somewhat speculative, though its fabric grows daily more massive. In an ambitious but not wholly convincing communication Marinesco, Sager, and Kreindler [3] report the results of examination of various pathological conditions. They confirm that the most striking changes in the electro-encephalogram are found when the cerebral cortex is directly affected by such agencies as raised intracranial pressure and cerebral tumours and abscesses, the abnormality consisting usually in the appearance of slow waves. They report abnormalities also in a collection of cases classified symptomatically as "aphasias" and "comas." The usefulness of such a classification is doubtful and the value of the material in this paper is lessened by the technical limitations that prevented the localisation of the discharges. This shortcoming accounts for the difficulty in appreciating the results and opinions of these and several other authors; for, being unable to localise the site of origin of the discharges they observe, they regard most of the features of the pathological electro-encephalogram as modifications of the normal occipital alpha rhythm. The intimate nature of the cerebral potentials may well be the same in health and disease, and there is some justification also for considering the brain as a single functional organ; but on the other hand there is important pragmatic evidence, both from clinical and electro-encephalographic sources, that, particularly in abnormal conditions, one part of the brain may behave independently of the other parts. As an example, in cases of motor aphasia Marinesco and his colleagues found an "alpha rhythm" of from 2·5 to 6 per second. But the records were taken with a single recording system leading from widely spaced electrodes, and the abnormality is just as likely to be due to a typical slow discharge from an abnormal frontal focus (which would fit in more neatly with the clinical picture) as to a slowing of the occipital alpha rhythm. The latter interpretation implies the premise that the alpha rhythm is an expression of the electrical activity of the whole cortex rather than an indication of a state of rest in the visual association areas.

The existence of such important differences in technique and basic ideas makes integration of the results from many laboratories almost impossible, but an excellent review by Fessard [4] presents in a concise and unbiased form the physiological and pathological facts which have been reported in the 82 papers to which he refers. An attempt to summarise this summary might lead to confusion and misunderstanding, but Fessard's conclusions with regard to clinical applications may be noted. Apart from cases of epilepsy and cerebral tumour and abscess (in which its localising power is unequalled) the diagnostic value of electro-encephalography is still only moderate. Its great advantage is that it causes no pain or inconvenience to the patient, and it may be said that when the record shows a distinct abnormality the presence of some organic nervous disease may be deduced, unless of course there are clinical reasons for suspecting the involvement of the nervous system in some general condition such as uræmia. A normal electro-encephalogram by present standards does not, however, exclude the possibility of organic disease; in fact, the clinical limitations of the technique and the precautions which must be taken in interpreting its results are those associated with any method based on empirical correlation.

The absence of an inductive explanation of the phenomena observed and the poverty of physiological data may be ascribed to two main causes —first the difficulty of experimenting with normal animals, and secondly what Adrian has described as the "disappointingly constant" character of the normal rhythms as opposed to the excitingly varied abnormal discharges which have already attracted so many workers from the laboratory to the clinic.

ACUTE NON-SUPPURATIVE THYROIDITIS

OF the inflammatory affections of the thyroid gland, acute non-suppurative inflammation appears to be decidedly the rarest. In *Minerva Medica* (1938, 29, 353) G. Giordanengo states that since 1904 when the condition was first clearly defined only 54 cases have been published. The earliest sign is the appearance of a tender localised swelling in the thyroid. The swelling does not remain confined to the gland but spreads into the surrounding tissues, and the overlying skin becomes red and œdematous but not adherent. Pain is a prominent symptom, radiating to the ear and arm on the affected side, and the patient assumes a wry-neck attitude. The temperature rises, often to 104° F. Swallowing is painful and difficult, but respiration is rarely impeded.

[1] Kornmüller, A. E., Die bioelektrischen Erscheinungen der Hirnrindenfelder, Leipzig, 1937.

[2] Marinesco, G., Sager, O., and Kreindler, A., *Bull. Acad. Méd., Paris*, 1938, 119, 360.

[3] — — — *Pr. méd.* April 27th, 1938, p. 650.

[4] Fessard, A., *Paris méd.* April 9th, 1938, p. 301.

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After a week or ten days all the symptoms and signs gradually disappear. Diagnosis is usually easy and the prognosis, as regards both life and the function of the thyroid gland, is favourable, though Graves's disease has occasionally followed.

The pathological changes in the gland have been investigated in 9 cases, and are characteristic. The intervesicular tissues show a moderate degree of infiltration with leucocytes or lymphocytes and a few plasma cells, but there is no tendency to abscess-formation, and the process terminates in fibrosis. The vesicles in the affected area show the following changes: first, proliferation of the lining epithelium, followed by detachment and degeneration of the cells; later, progressive disappearance of the colloid, infiltration with polynuclear leucocytes, lymphocytes, and large mononucleated cells; the formation of giant cells; and ultimately transformation of the entire vesicle into fibrous tissue.

The cause of acute thyroiditis is as yet unknown. Bacteriological examination has yielded consistently negative results.

THOMAS STEVENSON

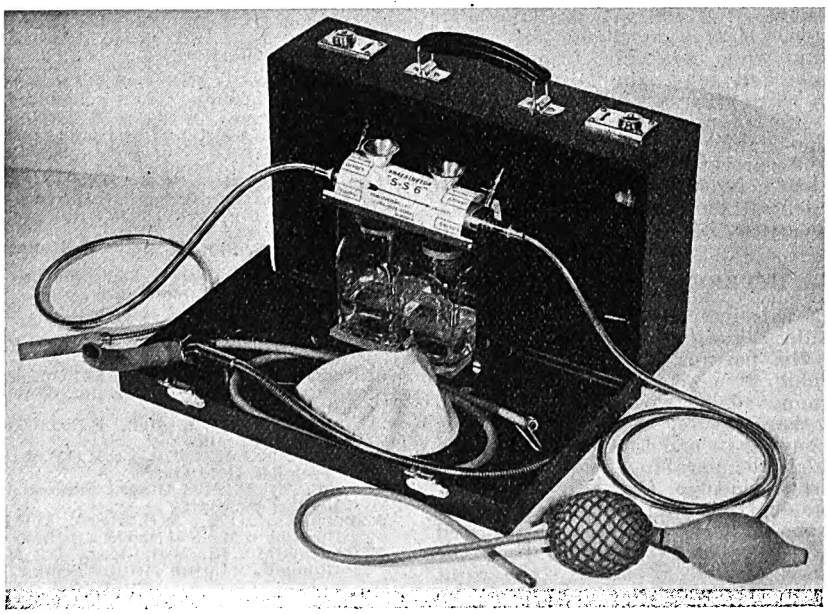
IN a note on the evolution of forensic chemistry, published in our issue of April 16th, we referred to Sir Thomas Stevenson, the analyst and toxicologist. It happens that our note appeared on the very day of Stevenson's birth a hundred years ago, April 14th, 1838. The son of Peter Stevenson, a Yorkshire pioneer in scientific farming, he studied medicine at Guy's Hospital, graduated with distinction in 1863, and set up in practice in Bradford. After a year he returned to Guy's as demonstrator and later lecturer on chemistry, becoming also lecturer on forensic medicine in 1878. Home Office work began to come his way in 1872, and in 1881 he was promoted to the rank of senior scientific analyst. As a witness he was impressive; his delivery was clear, convincing, and solemn, his evidence was carefully prepared, and his demeanour courteous and imperturbable. The biographical sketch by Jehu Junior which accompanies the Vanity Fair cartoon in 1899 facetiously suggests that he "was a very skilful hand at eluding a question." He figured in a number of sensational trials, such as the case of Dr. George Henry Lamson (1882) who, knowing that there was no chemical test for aconitine, had administered this drug to his brother-in-law. Stevenson, however, succeeded in proving the presence of the alkaloid in the dead body.

Purely scientific research did not particularly appeal to him, and, on the whole, he found himself too busy for it. Some of his "countriness" clung to him until the end; his bodily movements were somewhat ungainly in their activity, and he possessed a "rather clumsy aptness for breaking test-tubes." A big man with a large beard which early turned grey, prominent eyebrows, and a hearty laugh, he remains a vivid personality to those who knew him.

HEARING-AIDS

Messrs. John Bell and Croyden (Wigmore-street, London, W.1) have submitted to us particulars of their Belclere series of valve-amplification hearing-aids. This comprises three models. Type S is the most powerful; Type L, less powerful, is very small and light, measuring approximately 5½ by 4 by 3¼ in. and weighing 1¼ lb.; in Type W, the microphone and amplifier are contained in a small case designed to be worn in a vest pocket or under a lady's dress while the battery-case may be carried in a hip pocket. In all the models three stages of valve amplification are employed, together with a piezo-electric crystal microphone giving a very quiet background. The high-tension battery is said to last usually about three months, while the 3-volt low-tension battery gives about twenty hours of intermittent use, and is a standard Ever-Ready pattern costing sevenpence. A jelly-acid accumulator is supplied, if preferred, as an alternative. The frequency response can be corrected to suit each particular type of deafness, and this should be done in every case. The volume control is incorporated in the switch, and automatic volume control to suppress sudden loud sounds is also provided. The instruments are well designed and neatly finished; their prices are respectively 25, 20, and 18 guineas for Types S, L, and W, and they can be supplied for one week's trial before purchase.

A MODIFIED "SHIPWAY"



THE illustration shows a reconstruction of the well-known Shipway apparatus which has been designed by Dr. W. B. Primrose of Glasgow. A single rotating valve of simple pattern replaces the various rubber tube connections and non-return valves at present in use, and obviates the risk of wrong attachment. The valve, at the same time, gives any proportion of ether and/or chloroform with air or oxygen. Another position of the valve allows both bottles to be filled, the use of corks (of doubtful fit) being dispensed with. The supply and delivery tubes—the only tubes on the apparatus—are of thin flexible copper, and through their walls the vapours are heated to theatre temperature on their passage to the patient. The usual vacuum flask thus becomes unnecessary.

This compact and safe unit, with its accessories, is carried in an attaché case. The manufacturers are Anæsthetors Ltd., 163, Hope-street, Glasgow, C.2.

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A.R.P. IN FACTORIES

Two Home Office representatives attended by invitation a meeting of the Association of Industrial Medical Officers held in London on April 22nd.

Dr. N. W. Hammer, medical officer to the A.R.P. Department, said that within the scheme of the local authority factories should prepare plans to deal with their own special conditions. First-aid parties in a factory should consist of three men each, on the basis of two such parties for 250 employees, with an extra party for each additional 250 or part thereof. First-aid parties should work with rescue parties ready to give essential first-aid before sending the case to the first-aid post or hospital. Members should be trained to relieve suffering and to save life if the need arose by arresting urgent hæmorrhage or treating asphyxia from electrocution. A factory of any size should, he thought, make provision for the reception and treatment of those injured in an air raid, as a preliminary to being sent home or transferred to hospital. The factory should also provide for the cleansing of the uninjured but contaminated. It might sometimes be well to have a medical officer at the first-aid post to do *triage* and give interim treatment—e.g., anti-shock, including transfusions, before removal to hospital. In small factories first-aid might be given in one or other of the shelters provided for protection. Casualty service personnel must not overlook the need of first-aid training for surgical conditions, including thermal burns.

Mr. H. A. Strutt, a principal under-secretary of the Home Office, spoke on the need for coöperation between the factory and the local authority. It was hoped, he said, to work out model schemes for various types of factory, so that the management might turn at once for assistance to a detailed scheme worked out for premises not unlike their own.

BAD TASTE

AMONG 1000 patients at the Vanderbilt Psychiatric Clinic, H. H. Hart found 20, all females, who complained of a bad taste in the mouth (*Arch. Neurol. Psychiat., Chicago*, April, 1938, p. 771). Of these, 9 had some form of pelvic disorder and all suffered from sexual maladjustment. On the other hand, in only 1 of the 20 could dental, oral, or nasal infection be excluded. Of another group of 44 women, attending the gynæcological clinic, two-thirds (29) complained of bad taste in the mouth. This symptom was also present in 54 of 100 patients known to have dental infection. Harper concludes that many women, particularly when suffering from dental, nasal, or pelvic disorder, may complain of a bad taste in the mouth when their sex life is frustrated. From so small a series of cases it is surely rash to draw any such conclusion. Without involving a psycho-analytical interpretation, it would be safer to infer that the state of subnormal health which must accompany dental, nasal, or pelvic disorder, may itself be the cause both of cacogeusia and frigidity.

THE INTERCEPTOR

THE chief use of this instrument is to deposit a plug of soft paraffin accurately over the os uteri where it will bar the passage of sperms from the vagina. Such a plug, it is claimed, must remain in position until removed by syringing, and it will not melt at body temperature. The Interceptor is a form of syringe ending in a detachable perforated nozzle through which the paraffin is delivered. An adjustable stop-flange ensures that the nozzle is inserted to the same depth on each occasion, and it is suggested that this should in the first place be adjusted by a doctor, the object being to ensure that the contraceptive plug is ejected at exactly the right place. Once fitted in this way the Interceptor can be used without further expert assistance. By a system of locking between inner cylinder, outer cylinder, and plunger, it becomes a syringe available for flushing or suction. It can be sterilized by boiling and in its present form is a well-[illegible] piece of mechanism supplied in metal and leather cases. The maker, Mr. A. F. Shirreff (72, St. George's-road, London, S.W.1), has secured a patent.

Appointments

FISHER, R. E. W., M.B. Belf., Assistant Medical Officer for Air Raid Precautions for Holborn.

MACIVER, I. N., M.B. Durh., Whole-time Registrar to the Orthopædic Department of the Royal Victoria Infirmary, Newcastle-upon-Tyne.

MACKINTOSH, JEAN M., M.D. Glasg., D.P.H., Regional Medical Officer for Maternity and Child Welfare for Aberdeen.

MCKAY, MARY L., M.B. Glasg., Assistant Welfare Medical Officer for Co. Durham.

MILNER, A. N. P., M.B. N.U.I., Hon. Physician to the London Skin Hospital.

PECK, J. P. SAVILLE, M.B. Camb., Hon. Anæsthetist to the Ear, Nose, and Throat Department of the Kent and Canterbury Hospital.

RUSSEL, J. M., M.B. Edin., B.Hy., D.P.H., Temporary Assistant Medical Officer for Co. Durham.

RYAN, J. E., M.B. Melb., F.R.C.S. Edin., a Consulting Gynæcologist to the Charterhouse Rheumatism Clinic.

SCOTT, MARY, M.B., Hon. Anæsthetist to the Kent and Canterbury Hospital.

TIMONEY, JOSEPH, M.B. N.U.I., Assistant Medical Officer at the Wakefield Mental Hospital.

WAY, STANLEY, M.R.C.S. Eng., Whole-time Junior Gynæcological and Obstetrical Registrar at the Royal Victoria Infirmary, Newcastle-upon-Tyne.

London County Council Hospital Staff.—The following promotions in the mental services are announced. A.M.O. = Assistant Medical Officer:—

BLAIR, D. A. S., M.B. Camb., D.P.M., a Second A.M.O., Cane Hill Hospital;

BUTLER, E. N., B.M. Oxon., D.P.M., a Second A.M.O., Caterham Hospital;

KIRMAN, B. H., M.D. Lond., D.P.M., a Second A.M.O., Darenth Park;

STOKES, A. B., B.M. Oxon., M.R.C.P. Lond., D.P.M., a Second A.M.O., Maudsley Hospital;

THORLEY, A. S., M.B. Lond., D.P.M., a Second A.M.O., Friern Hospital; and

WHELEN, MAEVE, M.B. Lond., D.P.M., a Second A.M.O., Tooting Bec Hospital.

County Council of Middlesex.—The following appointments are announced:—

ASHER, R. A. J., M.B. Lond., Assistant Medical Officer, West Middlesex County Hospital;

CHIVERS, ELVA, M.B. Cape Town, D.A., Assistant Medical Officer (Anæsthetist), West Middlesex County Hospital;

TITCOMBE, I. M., B.M. Oxon., Obstetrician (Grade II), West Middlesex County Hospital;

JENNINGS, G. H., M.B. Camb., M.R.C.P. Lond., Physician (Grade I), Redhill County Hospital;

ROSSER, E. AP I., M.B. Lond., M.C.O.G., Obstetrician (Grade I), Redhill County Hospital;

SNAITH, L., M.S. Durh., F.R.C.S. Eng., M.C.O.G., Obstetrician (Grade II), North Middlesex County Hospital; and

HOUGHTON, L. E., M.D. Camb., Physician (Grade I), County Sanatorium, Harefield.

Hospital for Sick Children, Great Ormond-street, W.C.—The following appointments are announced:—

BONHAM-CARTER, R. E., M.B. Camb., M.R.C.P. Lond., Resident Assistant Physician;

FIELD, CONSTANCE, M.D. Lond., Resident Medical Assistant and Clinical Pathologist;

ILLINGWORTH, R. S., M.D. Leeds, D.P.H., Resident Medical Assistant and Clinical Pathologist;

GAIRDNER, DOUGLAS, M.B. Camb., Out-patient Medical Officer; and

LANDAU, MARJORIE, M.B. Lond., House Surgeon.

Colonial Medical Service.—The following appointments and promotions are announced:—

BEATTIE, D. A., M.B. Lond., F.R.C.S. Eng., Medical Officer, Malaya;

FORBES-WINSLOW, V. F., M.R.C.S., D.P.H., Medical Officer, West Africa;

HOLLINS, C., B.M. Oxon., Medical Officer, West Africa;

THOMSON, E. S. O., M.B. Edin., Woman Medical Officer, Malaya;

DEALE, J. E., M.B. Dubl., F.R.C.S. Irel., Senior Medical Officer, Gibraltar;

GILLESPIE, A. M., M.B., F.R.C.P. Edin., D.T.M., Senior Specialist, Gold Coast;

LAWRIE, E. S., M.B. Glasg., Surgeon, Grade B, Malayan Medical Service;

MACLENNAN, N. M., M.D. Aberd., D.P.H., D.T.M. and H., Director of Medical Services, British Guiana; and

WALKINGSHAW, R., M.B. Glasg., D.T.M. and H., Surgeon, Grade B, Malayan Medical Service.

Certifying Surgeons under the Factory and Workshop Acts: Dr. D. R. ASHTON (Yaxley District, Huntingdon); Dr. J. S. MACGILL (Denton District, Lancaster); Dr. A. L. E. F. COLEMAN (Anstey District, Leicester); Dr. R. D. SCOTT (Andover District, Southampton).

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ADDRESSES AND ORIGINAL ARTICLES

BIOLOGICAL THOUGHT AND CHEMICAL THOUGHT

A PLEA FOR UNIFICATION *

BY SIR FREDERICK GOWLAND HOPKINS, O.M., F.R.C.P., F.R.S.

PROFESSOR OF BIOCHEMISTRY IN THE UNIVERSITY OF CAMBRIDGE

IN preparing this lecture I have yielded to a temptation excusably felt I think by one who sees near at hand the close of an active career. To compare the present with the past in the field of his own activities, and to advertise the progress he himself has seen, is for such a natural impulse where opportunity is offered. If however I now yield to that impulse it is not without an ulterior aim.

No one with adequate knowledge will deny that the subject of biochemistry during recent years has shown itself to be a fertile field, at least for those intent on gathering a harvest of facts. The recruitment of labourers to that field has lately grown, and is still growing so fast that the facts garnered seem already overwhelming. In the minds of some at least, the question still arises: What (practical applications apart) is likely to be the ultimate significance for biological science of these myriad chemical facts? It is part of my intention to attempt in a very limited and humble way to make some appraisement of this significance.

To this end then I may first be allowed to estimate in fewest possible words the essential nature, as it appears to me, of the progress which biochemistry has made since I first had concern with it just fifty years ago. I can of course do no more than illustrate that progress with a few examples, dealing with its kind rather than its extent. I ought perhaps to say at once that when throughout this lecture I refer to its progress, I shall mean the advances it has made as a branch of fundamental scientific inquiry. Its practical applications in the field of Medicine and elsewhere are to-day not without general recognition. On these I will not dwell on this occasion.

OUTLOOK OF THE BIOCHEMIST

In my own earliest days all who hoped to apply chemical methods and chemical thought to biological problems suffered certain noteworthy disadvantages. First they obtained little help and no great sympathy from the organic chemists of the day, whose interests had for the most part wandered away from the study of natural products; then they felt acutely the lack of an adequate knowledge of colloids, for colloid science had been completely neglected after the pioneer studies of Thomas Graham, then thirty years old, and, again, they had yet to develop adequate methods for the service of what they conceived to be their own special needs. All disadvantages of this kind have happily disappeared to-day.

In those earlier days, however, the would-be biochemist suffered an inhibition of a different kind which, to some at least, myself among the number, was real. We had to face the distrust of the guardians of a territory which we hoped to invade. I am thinking in particular of the attitude of many experimental biologists, whose work just then was already revealing knowledge of great significance. Let me say here that encouragement for the chemist was not lacking from leading physiologists of that day; many of these believed that their own subject called for development on its chemical side. It was indeed that belief in the mind of one of the most eminent among them, the late Sir Michael Foster, which gave to me the opportunities I have for so many years enjoyed in Cambridge. But the professional interests of the physiologists were naturally centred mainly on the functioning of organs, or on the metabolism of the animal body as a whole, while the particular hope of the ambitious biochemist, when his thoughts ran ahead, was that he might contribute to knowledge of the nature of living stuff itself. With that ambition it was natural that he should endeavour to learn all he could about the known behaviour of living unit systems; the visible reactions, for instance, of cell protoplasm when submitted by experiment to varying conditions. There was here relatively little help from the histology of dead tissue cells as taught in the schools of anatomy and physiology. Rather had he to turn to facts revealed in the field of general biology and especially in that of experimental cytology. The remarkable potentialities of protoplasm then already being revealed by experiment strengthened the growing reaction against the mechanistic views which had held sway in the middle of the century, and stiffened the biologist in the belief that biology must remain a science sui generis, with its own primary concepts and its own ultimate units of significant structure. This meant the recognition of a grave breach in the unity of science, disturbing to chemical thought, and discouraging to the higher ambitions of the chemist.

The modern biochemist, rightly or wrongly, has gained in self-confidence, but it is well for him to remember that a conviction of his inability to contribute anything to the fundamental realities of biology is the basis of a definite philosophical outlook still attractive to the minds of not a few.

In an endeavour to illustrate the kind of progress biochemistry has made in my time and, if I can, its significance, I might have chosen almost any out of very many aspects. I have decided to make reference to some which to me, at least, seem characteristic. They are aspects which, in general outline at least, are among the most familiar, yet I feel that they, perhaps more than any other, have altered my own outlook. I will refer to our realisation of the fact that the phenomenon of *catalysis* is universal and fundamental in the scheme of living Nature, and further will remind you that the frank influence of molecular structure is exerted to the full in every living system. I will then ask you to remember the circumstance, now in a general sense so familiar, that the normal progress of events in every living system calls for the presence of a number of highly specific substances, each exerting its own peculiar influence in a quantity which is almost infinitesimal; implying that the chemical equilibria on which life depends may be balanced, as it were, on pin points.

CONCEPTIONS OF CATALYSIS

The thought of many biologists—in so far as it has concerned itself at all with the old problem as to why, in the conditions found in living tissues, chemical reactions involving stable substances proceed at all—has been content, it has seemed to me, to find a

* The Linacre lecture for 1938 delivered at Cambridge on May 6th.

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solution in the esoteric and irreducible properties of protoplasm, or in those of (to the chemist) equally unapproachable "living units" within the cell. This is not necessarily a vitalistic view, but may involve rather a disbelief in the ability of chemical methods to produce any adequate analysis. A great change in the outlook for biochemistry came, however, when it was first fully realised that the events of metabolism proceed in fact because they are catalysed, and on lines not differing in fundamentals from those of catalysis as observed in the inorganic world.

I sometimes find it hard on looking back to realise that, though the catalytic activity of enzymes outside the cell had been long known, the belief that they play so dominant a part in the interior economy of every living system was not reached till the very end of the last century. Even then the conception of intracellular enzymic activities was distasteful to many, and by not a few contemporary writers their real significance was doubted, or the extent of their influence minimised.

I will now discuss with all possible brevity certain current conceptions in the field of what is often spoken of as biocatalysis.

I must first make some reference to the colloidal structures of the cell, on which of course so many of its most fundamental properties and its visible behaviour depend.

When during earlier stages in the development of colloid science its data were applied to living systems, there was much emphasis on the general properties of surfaces and interfaces; but there was then but little understanding of how diverse and specific these properties may be. When thinking of those myriad chemical reactions (essential to the display of life) which simple molecules undergo in the aqueous phases of the cell, some of us were too apt to think of its colloidal complexes as just a special type of apparatus in which these reactions were suitably accommodated. But the recent great advances in our knowledge of surfaces, in particular of what has been called their "molecular anatomy," which in this or that case endows a surface with quite specialised properties, has shown that the due progress of the reactions is very intimately connected with the properties of the colloidal structures. Physical chemistry and organic chemistry here meet together. The remarkable recent increase in our knowledge of the intimacies of complex protein molecules which the application of physical and physicochemical methods is just now providing has here to be remembered. Though colloidal, these large molecules may yet be very "active." Many, if not all, enzymes for instance seem to be specialised proteins, and the isolation of many potent plant viruses, in the accomplishment of which my colleague Mr. N. W. Pirie has had so large a share, has shown that the active unit in each case is in essentials a complex protein molecule. The view is expressed that even a chromosome may be a unit structure in the form of a large protein molecule capable of a great variety of internal steric variations!

Experimental dealings with enzymes have now produced a vast literature, but I will confine my remarks to those special catalytic agencies which promote the processes of oxidation and reduction, thus making the potential energy of foodstuffs available for the activity of living cells. Some of my own colleagues have made important contributions to this field, and on such an occasion as this I may be allowed the luxury of choosing my illustrations chiefly from results obtained by them.

OXIDATIONS AND REDUCTIONS

All earlier efforts to explain the occurrence of tissue oxidations were directed to the discovery of how molecular oxygen, which vis-à-vis with the tissues is inert, is made capable of reaction. We have still to recognise the importance of oxygen activation, but it is remarkable how prominent in living cells is the additional activation of hydrogen. I must not stop to explain the steps by which realisation of this fact arose or mention the work of able investigators which led to it. In effect it means that the molecules of metabolites may be so affected by contact with special enzymes that hydrogen atoms in their structure are made labile and capable of transference to oxygen, or, and this is important, to other molecules. We now call the enzymes which so mobilise hydrogen by the name of *dehydrogenases*. It is customary and convenient to speak of the substances from which the hydrogen takes origin under their influence as hydrogen donators, and those to which it is transferred as hydrogen acceptors.

It seems sure that the influence of enzyme catalysis is never absent when other accepted criteria of life are present; or, since the present position of virus studies is making a definition of life even more evasive than it has hitherto been, let us rather say that it is never absent from a system which metabolises. Perhaps the power to metabolise independently is as good a criterion of life as any other. It is of great interest in illustration of this to follow the display of catalysis in free living unicellular organisms which, unlike the tissue cells of higher organisms, are fated to metabolise and grow in environments which may greatly vary. To the study of enzymes in bacteria, colleagues of mine in the Cambridge School of Biochemistry have made important contributions. Dr. Marjory Stephenson and (formerly) Dr. Quastel, with able collaborators, have worked there in this field for several years, and for me it would be a specially pleasant task to spend an hour in describing their researches, but I can only remark on the significance of some of the results. I must point out, however, that many of these researches have been carried out with the use of a special technique, originating in our department but now freely used elsewhere. This involves a study of events in the external medium induced by the organisms when not growing. In these circumstances the induced chemical reactions can be much more closely studied than when growth is proceeding. For the pathologist and for classical bacteriology, the interest of researches on non-proliferating organisms is at present perhaps remote, but they reveal, as no other technique can so well reveal, how remarkable is the catalytic equipment of these minute living units.

Very striking is the great number of substances, otherwise stable, of which the molecules become activated under the influence of specific dehydrogenases on the surface of a bacterium, thus becoming potential donators of hydrogen in the sense I have mentioned. But the very same surface may also present catalytic mechanisms dealing with hydrogen on quite different lines. Dehydrogenase activity requires the presence of hydrogen acceptors for its display, but a bacterium (*Bacillus coli* for instance) may at the same time be equipped with an enzyme—a *hydrogenlyase*—which so activates the hydrogen in a molecule that it is liberated in free gaseous form; and, yet again, a *hydrogenase* which is capable of activating inert gaseous hydrogen, so

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that it enters into reactions as a strong reducing agent. My colleagues have shown that bacteria can so control certain chemical reactions in the external medium as to establish true thermodynamic equilibria among the reactants, a point of considerable theoretical importance. The precise means by which anaerobic organisms, those which can dispense with oxygen, and those to which its very presence is fatal, obtain their energy for growth were long obscure. The Cambridge workers have thrown most interesting light on this problem. They have shown on quantitative lines that if substances are present in the medium in suitable pairs, one capable of acting as a hydrogen donator and the other as an acceptor, the processes of hydrogen transport under the influence of dehydrogenases can itself yield sufficient energy for growth. I will mention just one other phenomenon of quite peculiar interest which my colleagues have illuminated, though they were not the first to observe its occurrence.

While certain enzymes form part of the permanent constitution of each bacterial species, it would seem that others can be newly acquired as the result of contact with particular molecules in the external medium. These have been called adaptive enzymes in contrast with those which are constitutional. To take an instance which in particular has been studied in my department: it has been long known that certain bacterial cultures can break down formic acid into carbon dioxide and free hydrogen. If *Bacillus coli* (say) be first grown in a broth medium completely free from formic acid, it is found, when transferred to a simple medium containing the acid, to lack all power to decompose it, whereas a culture identical in origin but grown in the presence of the acid, is afterwards found, even when not growing, to decompose it vigorously. This is a striking phenomenon which should be borne in mind when we try to form a picture of how enzymes take origin during the growth and development of living cells in general.

There is at least some evidence that adaptive enzymes may appear de novo in the tissue cells of animals as a consequence of some change in the constitution of their internal environment. I do not think it over-bold to believe that here, in elementary form, we have a factor contributing to that fundamental quality of living beings, the power of adaptation. It is sure that chemical adaptations, great or small, accompany all adaptations in form and function. Comparative biochemistry and all that is special in the chemistry of individual organs make this sure.

The complexity of the catalytic equipment at such apparently low levels of organisation as that of the bacteria is certainly a striking thing. Dr. Stephenson has pointed out, I think rightly, that we should not be led by teleology to believe that every one of the specific mechanisms we can demonstrate to be present in a given organism is necessarily employed in its current maintenance. It is not to be denied, on the other hand, that for free living organisms which may have to adjust to great variations in their growth media such a wide equipment has great survival value.

As you will know, much study through the years has been given to the activities of that other type of unicellular organism, the yeast cell, and to the successive chemical changes involved in alcoholic fermentation. I should have liked to dwell a little on these if only in illustration of the significant circumstance that specific catalysts can direct, as well as promote, reactions. The enzyme equipment of the yeast cell is such that, by it, sugar is converted into alcohol and carbon dioxide. On the other hand such is the equipment of animal tissues that they convert the same sugar in similar circumstances to lactic acid. The directive influence of enzymes is an important element in their activity as contributing to the factors of chemical organisation in the cell. I must, however, say no more about the yeast cell, intensely as its activities have been studied since the days of Pasteur.

In the green plant enzymic activities are prominent and significant enough, but their organisation is much modified by the coexistence of the chlorophyll function.

STAGES IN OXIDATION

But I must rather turn to the mechanisms involved in the liberation of energy in animal tissues. Here again the mobilisation of hydrogen, and therefore the activity of dehydrogenases, is an outstanding phenomenon; but here we meet with agencies distinct from the enzymes proper, which with the enzymes form catalytic systems. Such systems may indeed be universal in biocatalysis, but they have been so far most clearly revealed in studies of animal tissues. To their study the Cambridge School, and especially Drs. M. Dixon and D. E. Green, with their collaborators, have contributed much of importance. The following are the essentials of what we know to-day about the more typical of these systems.

It has become clear that, in the tissues, energy is not made available by a single oxidative event, but more gradually in a series of steps or stages. We picture as being first displayed the activity of the enzymes proper. These are dehydrogenases which mobilise hydrogen in the molecules of metabolites derived from food-supplies. But on its way to oxygen this hydrogen finds an interrupted path. It is transferred in linked stages to a series of specific molecules which, as parts of catalytic systems, are maintained in low concentrations as permanent constituents of living cells. Each of these having acted as the hydrogen acceptor at one stage becomes the donator at the next stage; that is to say, these specific "carriers" of hydrogen, as we may call them, are capable of alternate and reversible processes of reduction and oxidation. Oxygen itself at the end of the series becomes in a somewhat special sense the final hydrogen acceptor. The dehydrogenases themselves would seem to be specialised proteins with highly specific relations. Each one can activate one particular metabolite and one only. This circumstance is highly characteristic of the systems we are considering. In many of these systems, and perhaps in the majority though not in all, the first hydrogen acceptor in the series has relations with the enzyme which are particularly intimate. It is known as a *co-enzyme*. We know of two such at least, each with specific relations. The essentials of their molecular structure are now fortunately known, and their study is dealing with a growing point in our knowledge of cell catalysis.

Another carrier (to be mentioned later) varying in nature in different systems may intervene between the co-enzyme and the penultimate member of the transport series, which is the cytochrome C of Keilin. This most interesting cell constituent is an iron-pyrrol compound related to blood pigment, though exercising so different a function. It is capable, like the other carriers, of reversible reduction and oxidation, and these processes involve a change of

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spectrum which fortunately can be observed during the life of the cell. Now the combined activities of the agencies previously mentioned reduce the cytochrome molecule with the hydrogen they transport, and the latter is then oxidised by the oxygen of respiration, though for the accomplishment of this yet another factor is required. The molecular oxygen must first be activated, and this is brought about by an agent which I think should be known as the cytochrome oxidase.

The following diagram sums up the relations of all these factors in a particular case. It illustrates the oxidation of lactic acid.

$$\begin{matrix} & H_2 & & H_2 & & H_2 & & H_2 \\ \text{Lactic acid} & \rightarrow & \text{Co-enzyme} & \rightarrow & \text{X factor} & \rightarrow & \text{Cytochrome} & \rightarrow & 0 \end{matrix}$$

$$CH_3CHOH.COOH + \tfrac{1}{2}O_2 = CH_3.CO.COOH + H_2O$$

It is clear then that for mobilising the hydrogen of diverse metabolites there are equally diverse mechanisms, and diverse paths along which the hydrogen is conducted to a place of meeting with active oxygen. It is of interest to note that some of these paths converge to join a final common path to oxygen provided by cytochrome. All this complexity gives us a glimpse at least into the organisation of events in the cell. If the only activation involved were that of oxygen itself, biological oxidations could not be so regulated, so specific, and so organised as we know they must be. Moreover, the gradual liberation of energy in successive stages, rather than only at a stage involving the union with oxygen, would seem to be a related aspect of biochemical organisation.

You will realise that I have told you only a part of a large story. In dealing with the oxidation of hydrogen, I have omitted for instance all mention of the origin of the respiratory carbon dioxide. I find I must leave that side of the story without discussion.

A tissue which in particular has occupied the labours of many biochemists, among them my colleague, Dr. Dorothy Needham, is muscular tissue. Indeed the labour spent on revealing the nature and sequence of the chemical events within muscle-fibres has been prodigious. The facts won are so numerous that I must be content to give them the barest reference. They relate chiefly to the successive changes which set free that proportion of the potential energy contained in the carbohydrate stores of the muscle, which is liberated in the absence of oxygen. A number of specific enzymes are concerned, but what the study of muscle has in particular revealed is that certain organic molecules only interact and only undergo certain kinds of enzyme-catalysed changes when they exist in combination with phosphoric acid. The transport of the phosphoryl group from molecule to molecule and the probable simultaneous transfer of energy from exothermic to endothermic reactions, though it does not occur in the carbohydrate metabolism of all tissues, as was first shown by Dr. E. G. Holmes in a study of brain tissue, is a biochemical phenomenon of great significance.

I will refer to studies of enzyme catalysis in just one more field, that namely of embryology. The writings of Dr. Joseph Needham awakened some years ago much general interest in chemical embryology, and his own work with that of his helpers has contributed much to knowledge of the subject. It is fated to become a very fertile field. I have hitherto made no reference to developments in experimental methods, but may refer here in parentheses to the great benefit biochemistry in general has received from the development of accurate micro- and, so called, ultra-micro-analysis. The ability to employ with confidence minute amounts of material in quantitative experiments has made possible the solution of many problems which at one time would have been thought to be unapproachable. I have for instance derived much pleasure from seeing Dr. Needham, with his colleague Dr. Boell, establish significant differences in the respiration of different parts of the gastrula of the embryo by the use of a method in which only a tenth of a milligramme or less of material was employed.

(To be concluded)

THE CLINICAL FEATURES OF CENTRAL PAIN*

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Central Pain with Spinal Lesions

It has been demonstrated experimentally that pain can be evoked by stimulation of the posterior horns and the sensory tracts of the spinal cord. Thus, by injecting minute doses of strychnine into the posterior grey matter in animals, Dusser de Barenne [11] caused "pain" and hyperalgesia in the distribution of the corresponding segments. Foerster,[20] in human subjects, has repeatedly evoked pain on the opposite side and below the level of the lesion by stimulating the anterolateral tract. He first observed it when he accidentally pricked the spinal cord with a needle introduced through an intervertebral foramen for spinal anæsthesia. Later he deliberately after laminectomy stimulated the region of the spino-thalamic tract with an electric current and by gentle pressure with a probe and obtained the same result. He also found that homolateral remote pain could be obtained by touching a posterior column. When the cervical region was the seat of experiment pain was evoked in the upper limb, from the column of Burdach, and in the lower limb, from the column of Goll. When the probe was placed in the angle between the columns of Goll, pain was complained of in the anorectal region. Foerster's results from excitation of the posterior columns are conflicting in relation to the effects he obtained from partial surgical section, for then over-reaction to painful stimulation, without apparent sensory loss to pain was obtained. His interpretation of these findings is that the posterior columns subserve a double function in regard to pain: (1) as a minor pathway for the conduction of pain impulses, and (2) as one of the inhibitory mechanisms for pain through its "epicritic" sensory functions. Be that as it may, he has shown that by stimulation of sensory spinal paths in man pain can be experimentally evoked, the pain being referred to parts below the level corresponding to the stimulated point.

Clinicians have long known that with central spinal lesions, from various causes, pain, local, remote or both, is not infrequent. In the majority

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of cases it is present only when the lesion is active, but in a minority it persists when the lesion is presumably quiescent.

By *local, or segmental, pain* is meant pain from affections of posterior horns referred to the corresponding dermatomes. It is thus ipsilateral. A difficulty, however, at once arises, as in the case of the descending root of the fifth in the medulla, with regard to the structural origin of such pain; for the grey matter or the intraspinal portion of the posterior root or both may be implicated and the differentiation is not easy either clinically or pathologically. Certain groups of cases can be at once excluded because of obvious involvement of posterior root fibres or ganglia, for example, tabes dorsalis and herpes zoster. In tabes, whilst the characteristic lightning pains might conceivably be due to implication of the intraspinal portions of the posterior roots, there is no reason to think that the grey matter is primarily diseased. In herpes zoster both posterior roots and horns are affected, although the main lesion lies in the root ganglia.

The origin of local segmental pains in some other diseases cannot be stated in precise terms, for again it is likely that in many cases both grey matter and intraspinal radicular fibres are damaged. In this group are to be included traumatic lesions, hæmatomyelia, syringomyelia, and disseminated sclerosis. For the present, however, it would be unpractical to draw too fine a distinction, especially since clinical and pathological knowledge is, as yet, incomplete.

Remote pains are those which are referred to parts below the level corresponding to the lesion and are presumably the result of disturbance of function of the sensory paths.

TRAUMATIC LESIONS OF THE SPINAL CORD

After *complete spinal transection*, as the initial phase of spinal shock is passing off, the patient becomes aware of phantom limbs and complains of uncomfortable sensations, such as tightness or even of pain, in them.[42 49] Sometimes the discomfort is considerable, but is usually slight and intermittent, and may be evoked or aggravated by reflex movements of the lower limbs or, according to Garçin, by stimulating the skin of the dermatomes immediately below those corresponding to the lesion. Such discomforts, as a rule, last only a few weeks in spite of persistence of the phantom limbs. Presumably the painful sensations are the result of stimulation of the spinothalamic fibres in the central end of the divided spinal cord and disappear with secondary degeneration. This explanation does not cover the persistence of the phantom limb, but this interesting problem lies outside the present discussion.

Severe pains may occasionally follow *hemisection of the spinal cord*. According to Garçin [23] remote pains are rare, usually transient, lasting only a few days, and are referred to the paralysed, non-analgesic side; but they may be bilateral. Hyperalgesia on the side of the lesion is more frequent and may persist.

Spinal concussion is the most common traumatic cause of pain and the lesions are almost invariably in the cervical region.[16 34 43] Pain, which is both local and remote, may be as severe, while it lasts, as in the worst cases of thalamic syndrome. Holmes has given a vivid description of pains of traumatic origin which, in his experience, can result from slight direct injury of the cervical enlargement, as well as from concussion. In his cases they developed immediately or soon after the injury, or there was a free interval which varied from a few hours up to two or three days. Local pains were commonly widespread and bilateral over the upper limbs, neck, and upper part of the chest, but, if more restricted, rarely corresponded to the distribution of a posterior root. Usually described as burning, shooting, or stabbing, they were more or less constant and were aggravated by stimulation of the affected region, especially by movement and sometimes even by light touch. Jarring the bed or vibrations, caused by people walking past, were often intolerable.

In addition to these local painful phenomena, severe pain in 16 cases was referred to the trunk and lower limbs remote from the level of the lesion.

In one case of injury of the cervical enlargement, which he quotes as a fairly typical example, pain developed in the lower limbs after an interval of seven hours. It was constant, dull, gnawing, and aching, associated with painful stiffness and numbness. Periodically, violent, shooting pains, like red-hot knives, would dart from the patient's foot or knee to his abdomen and down again. Paroxysms of severe burning and tingling of short duration spread over his leg, if it were touched even gently, and the most intense pain was evoked by rubbing or moving his limb. Straining in defæcation caused such severe pain in the right side and leg that it took him about an hour to empty his rectum. Holmes noticed that stimuli applied to a large area, for example, hot or cold water in a wide vessel or moving contact, were particularly painful.

On examination there was complete cutaneous analgesia on the left side below the third thoracic segment and, on the right side, on the inner aspect of his right upper arm and the right side of his chest within the distribution of the second to the seventh thoracic segments, with incomplete loss at the upper and lower borders. Deep pressure evoked some pain in the left lower limb. There was thermo-anæsthesia on the left side below the fourth thoracic dermatome but sensibility to heat or cold on the right side was unimpaired. Tactile sensibility was everywhere preserved, although localisation was very faulty in the right lower limb. Postural sensibility and vibratory sense were abolished in the right lower limb and trunk. There was complete paralysis of the right lower limb and trunk with corresponding reflex changes.

The sensory condition of the right lower limb and trunk, below the analgesic area, is of great interest.

There was no loss to prick even with the algesimeter; on the contrary, pricks evoked excessive pain which spread up and down from the point of stimulation. The lightest touch was appreciated, but moving contacts gave rise, at first, to a sensation of cold and, later, to tingling and pain below the waist. Slight scraping or rubbing with the fingers evoked considerable discomfort or even "an awful pain that shoots up to my waist"; and gentle pressure on the muscles or the toes was equally distressing. But the patient dreaded most of all movement of the limb. Thermal stimuli also caused an over-reaction. Water at about 24° C., and especially when the container was large, was said to be very cold and painful, "three times as cold" as on his arm. Similarly heat, even when moderate, was too hot and burning, "but warmth (about 45° C.) was always nice, very pleasant, and as far as it was possible to judge from his behaviour and descriptions it produced an undue degree of pleasurable sensation."

Four weeks from the date of the injury, the patient was evacuated to England and by that time there was considerable improvement in voluntary power. The spontaneous pains had diminished in severity and extent, but the objective sensory disturbances, including over-reaction, remained unaltered.

This most instructive case well illustrates the characteristic features of the local and remote severe pain with over-response. which may follow

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comparatively slight, but diffuse, traumatic lesions of the cervical portion of the cord. Their resemblance to those already described with thalamic and ponto-bulbar lesions is obvious. The over-response to pleasant warmth is of particular interest not only because it is unusual (as indeed it is in the thalamic syndrome) but because it can occur at this level of the central nervous system. A personal case will later be mentioned in which it was present in an adult suffering from disseminated sclerosis.

Another point of interest in this case was the intense painful over-reaction to stimuli, which normally are affectively neutral or at least not unpleasant, on the right side of the trunk and right lower limb, parts in which there was no objective cutaneous sensory loss. In consequence, the condition may be said to be one of hyperalgesia, but with the reservation that the pains, whether spontaneous or evoked by direct stimulation, were always abnormal not only in intensity but also in quality; in fact, they did not differ in any respect from those which occurred in association with obvious diminution of cutaneous sensation.

It will be remembered that hyperalgesia or over-response without sensory loss has been described in a few cases of the thalamic syndrome but a distinction, of probable importance, may be drawn between them and Holmes's spinal cases, in that the former were chronic and persistent and the latter acute and more transient.

As with pain at higher levels, wide irradiation was associated with defect in the sense of localisation.

As to the duration and intensity of pain, Holmes [34] found, in 12 cases with Brown-Séquard syndrome, that severe and persistent pain occurred only on the paralysed side. Spontaneous pains began to diminish towards the end of the second or third week, but sometimes lasted much longer. Over-response to peripheral stimulation also diminished, but was more chronic and did not disappear during the period of observation. Two patients for a short time had pain in the analgesic and thermo-anæsthetic lower limb which he attributed to transient local irritation of the blocked sensory paths.

Holmes's explanation of painful over-response to objective stimulation, in his traumatic cases, was that a certain modification in the transmission of impulses, favourable to such reactions, was brought about by the peculiar and incomplete damage to sensory fibres produced by the lesions. On the other hand, so-called spontaneous pains he believed to be due, apart from peripheral excitation, to the local irritative effects of the lesion. The chief pathological changes were relatively slight and diffuse, and consisted of constriction of the swollen cord by the inelastic pia, minute hæmorrhages, extensive œdema, and irregular swelling of the axis cylinders.

As has already been mentioned, Holmes found in his cases of Brown-Séquard paralysis that when unilateral analgesia and thermo-anæsthesia were complete, spontaneous, remote pain was rare and transient and hyperpathia was absent. Occasionally, however, in cases of Brown-Séquard paralysis, from trauma or other cause, discomfort, without pain, can still be evoked in spite of complete analgesia and thermo-anæsthesia. Two excellent examples have been described by Head and Thompson.[32]

CASE 1.—A man of 46 fractured his cervical spine. Two and a half years later there was wasting of his right hand with spastic weakness of his right upper and lower limbs, increased tendon reflexes, and an extensor plantar response. On his right side sensibility was unaffected, but on his left side there was complete loss of sensation to pin-prick below the second rib and of deep pressure pain (algometer) below the seventh rib. All other forms of sensation were normal. But within the analgesic area the painful interrupted current, although completely painless, gave rise to "an extremely uncomfortable sensation with violent movements of withdrawal."

CASE 2.—As the result of an asymetrical spinal lesion of sudden onset, a woman of 39 developed weakness of her right lower limb and complete loss of sensibility to pain and temperature in her left lower limb. When she first came under observation six months later, there was spastic paresis of her right lower limb with corresponding reflex changes. Sensibility to touch and light pressure was perfect and postural sensibility and tactile discrimination (compass test) were diminished in her right foot only. But in the whole of her left lower limb there was complete loss of sensibility to pain (superficial and deep), heat, and cold. Application of the painful interrupted current to her left lower limb was entirely painless but evoked a disagreeable exaggerated sensation "more unpleasant than pain" which was associated with rapid withdrawal of her limb. Also, when the algometer was firmly pressed on the sole of her foot it caused a painless, but tickling, sensation which was so uncomfortable that graduated tests with this instrument were impossible to carry out.

Thus, it would appear that impulses underlying discomfort can traverse the spinal cord by paths other than the contralateral spinothalamic tract. This question will be more fully discussed later.

Of the more chronically active conditions of the spinal cord which may give rise to central pain, *syringomyelia* is the most important. Painful phenomena, however, are present only in a minority of cases. The disease is usually most advanced in the cervical enlargement and local or segmental pains in the upper limbs, neck, shoulders, and upper part of the trunk are much more common than pain in the lower limbs. When it occurs, segmental pain is an early symptom and may precede any demonstrable sensory loss or other objective signs of disease. In a case described by Wilfred Harris [28] pain of this kind was present for seventeen years before the typical picture of syringomyelia developed. Most often it begins on one side but may spread to the opposite side, as well as upwards and downwards. At first it is apt to occur in attacks, but later may become persistent,[46 57] and occasionally remains even when analgesia and thermo-anæsthesia in the affected dermatomes is complete.[58]

In severity it ranges from a disagreeable paræsthesia, such as uncomfortable tingling, to violent pain, variable in character, but which may be described as severe, aching, shooting, or tearing and often as painful burning or cold. These pains are frequently accentuated by changes in the external temperature, as well as by direct stimulation within the painful areas. Thus pinpricks, heat or cold, pressure or movement of the limbs, and occasionally light touch or moving contact provoke intense exacerbations; and even noise, bright light, or emotional disturbances may be effective.[23] They often radiate widely within the affected region. In a word, they are again similar to the painful phenomena of the thalamic syndrome. Sooner or later they become associated with the familiar form of dissociated sensation in which there is loss to pain, heat, and cold with, as a rule, preservation of tactile sensibility and the forms of sensation which depend upon the integrity of the posterior columns.

The well-known autonomic disorders in the upper limbs, but especially in the hands, such as swelling

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of the soft tissues, blueness, dryness of the skin, and absence of the pilomotor reflexes, are more common in the painless than in the painful forms of syringomyelia. Such changes are obviously paralytic. Sometimes, however, autonomic affections of an active character may be associated with pain, as in a case described by Lhermitte, Bijon, and Nemours [44] in which, during paroxysms of pain, the hands became warm and red. Associations of this kind have been used in support of the vascular origin of many central pains, especially those of thermal quality, and for the conduction of pain impulses in the sympathetic. These questions have absorbed much attention especially in the French literature and will be touched upon later in these lectures. Remote pains, although infrequent, sometimes occur in syringomyelia at a stage when there is obvious compression of long tracts. Spiller [54] has recorded an excellent example in a woman of 60 who had dull, aching pain in her lower limbs which was aggravated by pressure and movement of the limbs. There was marked diminution of sensibility to pain, heat, and cold, as well as bilateral pyramidal signs. At autopsy a cavity was found extending from the seventh cervical segment to the mid-thoracic region but the lumbosacral portion of the cord was intact.

Spinal tumours.—With extramedullary neoplasms, local pain at the level of the lesion, and on the same side, is the common earliest symptom and, as is well known, may precede signs of spinal compression for long periods, if the growth of the tumour is slow. But it is radicular in origin and does not now concern us.

Local segmental pain with intramedullary tumours is, in comparison, infrequent, but it does occur in a proportion of cases, especially when the tumour arises in the posterior grey matter. The earliest symptom of a central glioma in this situation may be unilateral pain of segmental distribution which gradually, but more rapidly than in syringomyelia, spreads upwards and downwards as it involves successive segments. With it there is sensory loss and hyperpathia beginning in the dermatomes which were first the seat of pain. As the analgesia increases pain usually, but not invariably, subsides.

With ependymal gliomas unilateral, or bilateral, segmental pains sometimes develop concurrently with, or about the same time as, the paraplegic signs in the lower limbs.[5] Here the pain may be due to compression of the posterior roots, as well as the sensory grey matter, for it may be accentuated by coughing or straining.

The not uncommon occurrence of remote pain in the lower limbs with extra- and intra-medullary cervical or thoracic tumours is less generally recognised. Horsley [35] was probably the first to draw attention to them and since then they have been recorded by many observers.[3 9 14 16 20] Because of the lamellar, segmental arrangement of fibres in the anterolateral sensory tract, the fibres from the lower dermatomes being postero-external and those from the upper dermatomes antero-internal, remote pain with extramedullary posterolateral tumours usually begins in the opposite lower limb. With intramedullary tumours, however, the rule is less general for whilst sensory loss most often is first discovered in the dermatomes near the level corresponding to the lesion, pain is often first referred to the lower limbs and not to the region of early analgesia.

Elsberg,[14] Parker,[46] Garçin,[23] and Davison and Schick [9] have described excellent examples of pain in the lower limbs with extramedullary tumours. In Elsberg's case of tumour at the level of the fourth thoracic segment a painful sensation of burning was early complained of in the foot, and Garçin had a similar case of calcified meningioma at the level of the second thoracic segment with pain in the legs and feet, without radicular pain at the level of the lesion. In Parker's case severe and persistent pain in the lower limbs was caused by compression of the sixth and seventh thoracic segments by an extramedullary tumour. Such cases are by no means unfamiliar and several have come within my experience.

Illustrating remote pain with intramedullary neoplasm, Feiling [16] quotes a case of his own in which a tumour stretching from the third to the sixth cervical segments gave rise to severe, continuous pain in the trunk and all four limbs. They were described as vibrating pains with exacerbations of cutting pains, which were provoked by movement or pressure of the limbs.

Pain may be very severe and accompanied by intense over-reaction even to slight stimulation, as in Davison and Schick's Case 2 [9] in which the pain was agonising and was accentuated by the gentlest movement or pressure. Even touching the tips of hairs was disagreeable. It may be noted that in this case there was no loss of posterior column sensibility.

Abnormal and usually disagreeable sensations are very common in *disseminated sclerosis* and form an essential part of the clinical picture in *subacute combined degeneration*, but they are rarely painful. Tingling, numbness, a sense of constriction, and thermal dysæsthesiæ are most often described. Tic douloureux, usually unilateral but sometimes bilateral, as a rare symptom of disseminated sclerosis is familiar but as has already been said it is very questionable whether it should be included in the category of pain of central origin. In the same disease segmental areas of tenderness are common enough with spinal lesions and are probably, in the main, the result of affection of the sensory grey matter, but involvement of the intraspinal portion of the posterior roots cannot be excluded.

An interesting case which was under my observation and showed the unusual feature of excessive pleasure on gentle superficial stimulation of one lower limb along with hyperpathia on deep pressure is worth recording.

A physician, aged 55, noticed one night in bed that his right lower limb jerked spasmodically when he was going to sleep. Next day there was some stiffness of the same limb when he walked, and when sitting on the lavatory seat he was aware of a sensation of warmth in the parts of his left lower limb which were in contact with the seat. Also, whereas before he had suffered from cold feet, his left foot now felt warm. The weakness of his right lower limb increased and on the fifth day of the illness, when examined by me, he discovered that a very pleasant sensation could be evoked by stroking his left lower limb. He had been free from pain and his bladder, rectal, and visual functions had been unimpaired. Then, as throughout his illness, he did not at all feel distressed or uncomfortable; on the contrary he felt happy and a little excited that his experience was so agreeable.

In the past he had had many attacks of lumbago and three years before had developed rheumatoid arthritis which, however, had become quiescent some time before the onset of his present illness. In 1910 he had a febrile attack, which lasted for a few days. There was no previous history of any organic nervous symptoms and he had been free of venereal infection. His alcohol consumption was moderate but he was a heavy smoker.

On examination he was an unusually helpful and intelligent witness, well trained in observation.

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I had known him for many years and considered that although at this time he was a little euphoric, his critical judgment was not impaired. Speech and articulation were unaffected and his discs, pupils, and cranial nerves normal, except for lateral nystagmus. In addition, the left pupil was smaller than the right and the left upper lid drooped slightly, abnormalities which, he maintained, had always been present. There was some weakness of both upper limbs, without dystonia or incoördination, probably due to old arthritis. Slight pyramidal motor and reflex signs were present in his right lower limb and his lower abdominal reflexes were absent without weakness of his abdominal wall.

It was the sensory condition of his lower limbs, however, that is of especial interest. No sensory impairment was discovered in his right (weak) lower limb, but in the areas corresponding to the twelfth thoracic and first lumbar segments there was some cutaneous tenderness. On the left side there was complete cutaneous analgesia below the second lumbar dermatome and relative cutaneous analgesia in the first and second lumbar dermatomes. Deep pressure on his left calf at first evoked a sensation as if the pressure were being exerted through thick cloth. But in a few seconds "there came a sensation which I call hellish. It was a dull, abominable pain with a quality of misery and hatefulness which one does not get with ordinary pain. It was diffuse, far wider than the pinch." It lasted for some seconds after the pressure had ceased. From this description there is no question about the hyperpathic reaction. On the other hand, by gently stroking his left lower limb, the unusually pleasant sensation, which he had described, could be elicited and it was possible to do so for about a week. It disappeared about the same time as the spontaneous sensation of warmth in the limb. Sensibility to light touch was little affected but thermal sensibility was more impaired. Recognition of posture and passive movement and of vibrations of a large tuning-fork was perfect.

The cerebro-spinal fluid contained seven small mononuclear cells per c.mm., total protein was 100 mg., globulin reactions were positive, the Lange reaction was fairly strong and of the luetic type, and the Wassermann reaction was negative.

Three months after the onset of the illness he was still easily tired and was apt to experience waves of heat down his left lower limb when he got up to walk. There was no apparent loss of power or of cutaneous sensation, but pinpricks felt sharper in his left than in his right lower limb. Nystagmus persisted.

Disagreeable sensations and occasionally pain referred to remote parts, and associated with over-reaction, are also unusual symptoms of syphilitic myelitis, vascular lesions, or toxic myelopathy, and they resemble those described in other spinal diseases.

Central Pain with Cortical and Subcortical (suprathalamic) Lesions

As a result of the widespread interest among neurologists in central pain, the long debated question of the relationship of the cerebral cortex to pain sensibility has been reopened.

In 1912 Head and Holmes [31] brought forward the revolutionary doctrine that the optic thalamus is the essential organ for conscious appreciation of pain and all affective experience, whilst the sensory cortex deals with the discriminative aspects of sensation and in addition controls thalamic activity. Their investigations led them to believe that with purely cortical stationary lesions sensibility to pain remains intact. Pinpricks may appear to be less plain on the affected side, but this defect is not of appreciation of pain but of recognition of the pointedness or size of the stimulating object. This view has become accepted by many, but not by all. Most of the critics, whilst agreeing to the predominant rôle of the thalamus, insist that the sensory cortex is also, to some extent, concerned with sensibility to pain. Their evidence, based on the presence of analgesia of cortical origin, is of unequal value, and much of it is open to criticism on the criteria laid down by Head and Holmes,[31] who maintained that only those cases could be accepted in which the lesions are quiescent. They claimed that the diminution of sensibility to pain which is found with active cortical lesions, including epileptiform seizures, is the result of neural shock or diaschisis on the optic thalamus.

A more serious difficulty is in regard to the anatomical one of the depth of the lesion. For if lesions restricted to the cortex are alone to be accepted, then only pathological examination can determine whether they are so or not. And many of the cases used by both Head and his opponents did not come to autopsy. This point is of some importance, for Head and Holmes admit that with subcortical destruction some persistent analgesia may occur. It can in fact be reasonably argued that a lesion, which extends from the cortex into the white matter by destroying fibres of the sensory projection system and, perhaps in addition, association fibres, will result in sensory loss of greater intensity and extent than will follow a lesion of the same size which is confined to the cortex. Cases of extensive cortical lesion without involvement of the corona radiata, suitable for careful sensory examination, must be few in number; and since the lesions in most cases used in argument for or against Head's views have been due to tumour, trauma, or thrombosis, in at least most of them, the subcortex has not escaped. When pathological verification is not possible, it seems therefore to be a question of comparison of the effects from superficial and deep lesions rather than from purely cortical and subcortical damage.

Nevertheless, Head's views have in general been substantiated and accepted, if with modification. Foerster,[20] for example, believes that in the majority of cases there is no loss to pain with stationary superficial lesions and that, even immediately after limited surgical excision of the ascending parietal or superior parietal convolution, this form of sensibility may be unaffected. But some impairment of pain sensibility may be found with quiescent superficial lesions of the sensory cortex and, in his experience, more often when they are bilateral than unilateral. He admits, however, that, under any circumstances, it tends, as time goes on, to diminish and even to disappear, in contrast with the more persistent loss of the discriminative aspects of sensation. In his view, with cortical damage, pain is less affected than all other forms of sensation. He agrees with Head that the optic thalamus is probably the chief organ by which pain is appreciated but concludes, from stimulation experiments as well as his investigations on sensory loss, that the cortex participates to some extent in pain sensibility. The infrequency of persistent analgesia from cortical damage, as compared with the constant loss of the discriminative aspects of sensation, he suggests may be due not only to the feebler but also to the wider representation of pain in the cortex.

But apart from the question of sensory loss, the participation of the sensory cortex in sensibility to pain, limited though it may be, is demonstrated by the occasional occurrence of pain as an aura of sensory epileptiform seizures and a

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result of electrical stimulation. As an introduction to the clinical evidence the strychine experiments of Dusser de Barenne[11] may be recalled. By the application of a weak solution of strychnine to the cortex of one hemisphere in apes, he evoked bilateral hyperalgesia, but more on the contralateral side, and more in the distal than in the proximal parts of the limbs. As he rightly insisted, however, this method cannot be strictly compared to the method of electrical stimulation which has been employed in man; for strychnine, applied to the cortex, seems to produce maximal effects.

Electrical stimulation of the sensory cortex in conscious human subjects has been carried out by a number of neurosurgeons, since Cushing[8] first employed it on two patients. By faradisation of the ascending parietal convolution, he evoked numbness and other tactile sensations, but not pain, in parts of the opposite side of the body corresponding to the stimulated regions. Van Valkenburg[61] used the same method, but it was for the first time extensively employed in exploration of the human cerebral cortex by Foerster.[21] Among the sensations his patients described were numbness, tickling, congestion, burning, itching, prickling pain, and deep pressure pain. They were obtained only from the ascending parietal and superior parietal convolutions, and whilst the results from both were the same in quality, they differed in distribution. From the ascending parietal convolution they were local and referred to parts which corresponded to the region of stimulation, but sensations from excitation of the superior parietal gyrus were said to develop in the whole of the opposite side of the body. In spite of limitation of sensory responses to the parietal lobe Foerster, from other evidence, arrived at the conclusion that the pre- and post-rolandic convolutions were sensorimotor.

Penfield and Boldrey[46] confirmed the majority of Foerster's observations; but their results diverged in certain important respects probably due to difference in the electrical methods employed and also to their strict elimination of epileptiform attacks from consideration in this connexion. In the first place, sensory effects were obtained by them from the pre-central cortex, although much less frequently than from the post-central convolution, and, of more direct interest in regard to central pain, painful sensations were very rare. They were present in only 11 out of over 800 responses and were never severe. Penfield and Boldrey concluded that pain has little if any true representation in the cortex, but, like Foerster, believe that the pre- and post-rolandic cortex is sensorimotor in function.

Penfield thus evoked painful sensations less frequently than Foerster and, when obtained, they were less severe. In addition, unlike Foerster, he is disinclined to accept its cortical origin, believing that it arose from disturbance of function (release or excitation) of the thalamus. But although pain is a rare result of electrical stimulation of the cortex, if it is a primary response, there is no good reason for supposing its origin to be different from the more common sensations of numbness or tingling or the less common sensations of movement or altered temperature of a limb which were hardly more frequently obtained than those of pain and are generally assumed to be cortical. Of all forms of sensation, pain is the least differentiated and discriminative and so has a feebler cortical appeal.

The strychnine experiments of Dusser de Barenne,[11] and the electrical stimulation experiments of Foerster[21] and Penfield[47] cannot be strictly compared to the effects of disease processes. Nevertheless, they bear upon the significance of those disagreeable and painful sensations which sometimes form the aura of Jacksonian sensory epilepsy. Ajuriaguerra[1] has described sensations of tingling, itching, burning, pricking, crushing, and sometimes severe pain. Many examples are on record and cases have come within the experience of all neurologists.

For example, Souques's patient,[53] from whom a cortical psammoma which was removed, complained of cutting pains in his hand and spreading up his arm, in sensory epileptic attacks. In the case described by Guillain, Girot, and Bertrand,[27] very painful stinging and crushing sensations beginning in the left hand and spreading up the limb to the trunk, formed the aura of fits from which the patient suffered till his death. At autopsy an area, 2 cm. in diameter, of superficial softening of the cortex of the upper third of the right post-central gyrus was found.

When, however, pain is not the primary symptom of the attacks but follows other abnormal sensations, as in the following case, it is less clearly of cortical origin and may well be due to thalamic release, as Penfield has supposed.

A man of 64, who at operation was found to have a left parieto-temporal glioma, was subject to epileptiform seizures as the initial symptoms of his illness and before headache and papilloedema had developed. The attack commenced with a sensation of pins and needles in his right thumb which spread up his arm to his right eye when his eyelids twitched. His right arm then dropped useless to his side and, in his forearm, a very severe aching pain developed and lasted for a few minutes before suddenly disappearing. In the seizure his speech was incoherent, but there were no involuntary movements, other than twitching of his eyelids, and his lower limb was unaffected. In about half an hour after the fit voluntary power in his upper limb recovered but incompletely.

Cortical lesions giving rise to painful epileptiform attacks, may result from tumour, thrombosis, inflammation, or trauma. The distribution of the pain follows the general rule in sensory epilepsy in that it begins focally and spread with the characteristic Jacksonian "march." An exception is Foerster's case[20] of traumatic lesion of the superior parietal convolution, in which pain was referred to the whole of the opposite half of the body at the same time, which brings to mind the similar effects he obtained from electrical stimulation of this part of the parietal lobe. They, however, await confirmation, for Penfield's results were invariably local.

Needless to say, in the consideration of pain as an epileptic phenomenon, for the purposes of our present argument, only those cases are valid in which pain is unassociated with muscular spasm or clonic movements. In this connexion, a striking example is that described by Foerster[20] in which pain was evoked in a phantom limb by stimulation of the opposite sensory cortex.

With regard then to the question of representation of pain in the sensory cortex, it is reasonable to conclude that the cortex is concerned with pain, as with all forms of sensation, but in less degree, and chiefly in respect of its limited discriminative aspects.

CONTINUOUS PAIN WITH CORTICAL AND SUBCORTICAL (SUPRATHALAMIC) LESIONS

In another category, but of equal interest, are those rare cases of *persistent* pain or discomfort in a part, or the whole, of one side of the body associated with sensory loss and hyperpathia, following gross,

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and usually extensive, suprathalamic lesions of the opposite hemisphere. The cases to which I refer are those in which the optic thalamus has been proved at autopsy to have escaped direct involvement; but both sensory cortex and subcortical white matter are damaged. As a rule, pain and hyperpathia occur early in the clinical history. In such cases the most probable explanation of the continuous painful sensations is release of the thalamus from destruction of cortico-inhibitory fibres. An excellent example is Davison and Schick's Case 10.[9]

A man, aged 53, who suffered from mitral stenosis and cardiac failure, had a stroke which affected the left side of his body. He complained of spontaneous pains on that side which were aggravated by stimulation. Thus light touch, pressure, combing his hair, or pinpricks evoked pain in his left upper and lower limbs, as if a sore were being irritated. Movement of a limb or the vibrations of a tuning-fork were similarly painful, and eating or drinking hot or cold fluids caused sharp radiating pains in the same distribution. On the affected side there was reduction of sensibility to touch, heat and cold, diminished vibratory sense and astereognosis, in addition to flaccid hemiparesis. By an unfortunate omission, the state of pain sensibility is not mentioned in their report. The patient died of broncho-pneumonia nearly two years after the stroke. At autopsy the brain was examined by serial section and revealed occlusion of the post-central and posterior parietal branches of the right middle cerebral artery with softening of the post-central, superior parietal, superior temporal, and insular convolutions. The optic thalamus was spared.

Guillain and Bertrand's case[26] is even more remarkable. The patient for six years up to the time of his death complained of severe, continuous, spontaneous pain, especially in both upper limbs, which was aggravated by even the slightest contact or movement. His mind remained perfectly clear throughout his long illness. Whe he died, *bilateral* symmetrical atrophy, from vascular softenings, was present in the ascending parietal and occipital convolutions. The optic thalami, brain-stem, and spinal cord were unaffected.

Ajuriaguerra[1] collected from the literature and from Lhermitte's clinic eight cases of central pain from vascular lesions of the parietal lobe in which the optic thalami escaped.

Very occasionally parietal tumours may be associated with continuous pain and hyperpathia, and Ajuriaguerra[1] and Garçin[23] quote several examples. In Foerster's case[20] of a large meningioma of the inferior part of the right parietal lobe, which also compressed the superior part of it, severe pain, in the left upper and lower limbs, for a long time preceded the development of clear evidence of tumour. But with neoplasms it is admittedly less possible to be certain that the optic thalamus is unaffected; for although it may not be invaded by the growth, its function may be impaired by interference with its blood-supply from compression or œdema.

Nevertheless, it is clearly demonstrated, by cases of cerebral softening alone, that persistent painful phenomena closely resembling, and sometimes indistinguishable from, those of the thalamic syndrome may result from purely suprathalamic lesions. They supply strong evidence for Head's theory of the inhibitory function of corticothalamic fibres. This explanation, however, probably does not cover all recorded cases of continuous pain with suprathalamic lesions. For, when with apparently stationary lesions, pain develops late it may, as suggested by Ajuriaguerra,[1] be the result of retrograde changes in the optic thalamus.

THE PHOTODYNAMIC ACTION OF CARCINOGENIC AGENTS

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In two letters to *Nature* (Mottram and Doniach 1937a and b) we have described experiments showing that four blastogenic agents sensitise the skin of mice to near ultra-violet radiation, and that these agents also have a photodynamic action on ciliated infusoria. The term blastogenic is applied to these agents because they give rise to innocent as well as malignant tumours of both epithelial and connective tissues.

Lewis (1935) has observed that if the blastogenic agents 1 : 2 : 5 : 6-dibenzanthracene, 3 : 4-benzpyrene, and methylcholanthrene are added to tissue cultures of chick-embryo cells, these show abnormal mitoses when they are exposed to light, but not if they are kept in the dark. In view of these results, the photodynamic action of a series of cyclic hydrocarbons, some of which are blastogenic and some inactive in the production of tumours, has been investigated. These were kindly supplied by Prof. J. W. Cook. The infusorian Coleps (species probably *hirtus*) obtained from a nearby pond was employed for these tests. In order to apply the hydrocarbons, which are extremely insoluble in water, to the infusoria, colloidal suspensions were made by dissolving the substances in acetone, stirring the solutions into a 1 per cent. watery gum-acacia solution, and then removing the acetone by evaporation. The suspensions were then made up to 1 part of hydrocarbon in 10,000.

Preliminary experiments showed that when mixtures of these colloids with an equal volume of tap-water containing coleps were kept overnight or for several days in the dark the organisms remained alive and active, whereas when such mixtures (containing 1 part in 20,000) of the hydrocarbons were exposed to a mercury-vapour lamp using a glass filter, the infusoria rapidly died and cytolysed. Many attempts were made to cytolyse red cells but without success. The conditions of exposure were: lamp distance, 26 cm.; current, 3·4 amps. 103 volts; screen glass opaque to radiations below 330 $\mu\mu$. The cultures were placed on thick lead blocks to keep them cool. Control cultures without hydrocarbons were exposed to the lamp for several hours without damage. The results are given in Table I. For comparison 1 in 20,000 emulsions or solutions of tar, soot, shale

TABLE I—TIME REQUIRED TO KILL COLEPS, USING DILUTIONS OF 1 IN 20,000

	Min.		Min.
Tar	4 & 5	Anthracene	31, 32, & 39
Cholanthrene	8 & 9	1 : 9-dimethyl-phenanthrene	35, 41, & 43
3 : 4-benzpyrene	10 & 11	1 : 2 : 5 : 6-dibenzacridine	Above 60 inactive.
Methylcholanthrene	10 & 12	1 : 2-benzfluorene	
Soot	14 & 14	Fluorene	
1 : 2-benzanthracene	13 & 16	Phenanthrene	
Eosin	16 & 16	Cholesteriline	
3 : 4-benz-phenanthrene	17, 18, & 21	Perylene	
1 : 2 : 5 : 6-dibenz-anthracene	19, 20, & 21	Cholesterol	
Shale oil	28 & 29	Ergosterol	
2 : methyl-3 : 4-benzphenanthrene	30, 30, & 35	Liquid paraffin	

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oil, liquid paraffin, and eosin are included, eosin being a dye with a powerful photodynamic action and one which is commonly used for demonstration purposes. It may be here mentioned that there are many dyes which have photodynamic action and no blastogenic activity: eosin is therefore omitted from Table IV which deals only with cyclic-hydrocarbons.

Exposures to the mercury-vapour lamp were next made through a 2A Wratten filter which stops all ultra-violet radiation, transmitting only light above 410 μμ. Under these conditions no photodynamic action was observed. When exposures were made direct to the lamp or through quartz, the organisms were quickly killed in the absence of hydrocarbons. Hence it is not possible with coleps to investigate photo-sensitisation to the middle and far ultra-violet, and the photodynamic action observed is confined to the near ultra-violet radiations between 330 and 410 μμ. Many tests were made in sunlight, both direct and behind glass, and in order to reproduce conditions under which superficial tumours occur in animals, behind keratin. For this purpose the transparent quills of birds and the transparent cast skin of a snake were used. Keratin was found to transmit these activating radiations.

Quantitative results cannot be obtained with sunlight because of its varying intensity; however, by exposing the agents in pairs their order of activity was found to be approximately the same as with the mercury-vapour lamp. This was unexpected, for, whereas sunlight has a continuous spectrum, the mercury lamp gives a line spectrum, and such very different radiations might be expected to give different results according to the varying absorption spectra of the hydrocarbons used. It is, however, generally agreed that in photodynamic action the radiation required is determined by neither the absorption spectra nor the fluorescence spectra of the agents, but by the absorption spectra of the agents after their combination with the cell proteins. This may be the reason why such different radiations as sunlight and the mercury-vapour lamp produce similar results.

The experiments so far described were made with colloidal suspensions. Since it is rare for colloidal suspensions of insoluble substances to have biological action, other methods of testing were therefore employed to find whether the results were due to substances in solution rather than to the colloidal particles. The hydrocarbons were dissolved in acetone and drops allowed to evaporate on glass slides, leaving dry films on the glass. On these films drops of water containing coleps were placed and it was found that whereas the organisms remained active in the dark they quickly died when exposed to the mercury-vapour lamp screened with glass as before. All the hydrocarbons previously found active were active using this method, and also tar, soot, and shale oil. The photodynamic activity was increased by keeping these preparations in the dark overnight before exposure; on the other hand, neither previous washing of the films under a tap nor repeated exposures of the films exhausted them. The results suggested either that the hydrocarbons were sufficiently soluble in water to produce the action, or that they contained an impurity which is soluble in water.

Next, various methods of making water-soluble extracts were tried, and the following was found most satisfactory. The hydrocarbon was dissolved in benzene and shaken with water, and the water was then separated and evaporated to dryness. A yellow or brown scale remained in the evaporating basin which was completely soluble in water, giving a glass-clear yellowish solution. Watery extracts were thus made, using a few milligrammes of 3:4-benzpyrene, cholanthrene, and 1:2:5:6-dibenzanthracene. The final solutions were made up to a few cubic centimetres and were found to be very active in causing the death of coleps exposed to the mercury lamp. It was evident that in these three compounds impurities soluble in water were present and that these were actively photodynamic.

Now it is well known that many cyclic hydrocarbons are unstable in the presence of light and form oxidation products which are soluble in water. Since the preparations used had not been made in the dark it seemed likely that these water-soluble impurities were responsible for the photodynamic action. Investigations have been made in two directions to decide this: hydrocarbons have been exposed to light to find whether their photodynamic action is thus increased; and preparations purified in the dark have been tested to find whether they then have little or no photodynamic action. Saturated solutions of a number of hydrocarbons in liquid paraffin were made and tested by applying drops of water containing coleps to smears on glass sides; the paraffin solutions were then exposed to the mercury-vapour lamp unscreened for 40 minutes, and smears on glass slides were again made and tested. Before exposure to light the times taken to kill the organisms were 30 and 32 minutes with cholanthrene, and 41 and 43 minutes with methylcholanthrene. After exposure to light these times were reduced to 8 and 13 minutes respectively, so that exposure to light increased the action.

A more convincing experiment was carried out with 3:4-benzpyrene.

Three 5 mg. samples of yellow, impure benzpyrene were taken and dissolved in 10 c.cm. of benzene. Sample A was exposed in a Petri dish to the mercury lamp through quartz for one hour (the solution became brown); B was exposed through glass for three hours (it became orange); C was not exposed. Watery extracts were then made by shaking with 100 c.cm. of water, separating the water, evaporating to dryness, and finally taking up the residue with water (1 c.cm. per mg. of benzpyrene taken). These watery extracts were tested and the results are given in Table II. At the same time the hydrocarbons were recovered by evaporating off the benzene, dissolving them in acetone, and making 1 in 10,000 colloidal suspensions, as already described. These were also tested and the results are given in Table III. In both cases exposure to the mercury-vapour lamp, especially through quartz, greatly increased the photodynamic activity.

The second method of investigating the rôle of these impurities was also made use of. For this

TABLE II—TIME REQUIRED TO KILL COLEPS USING WATERY EXTRACTS; 1 C.CM. OF THE EXTRACT EQUIVALENT TO 1 MG. OF HYDROCARBON

	Min.
(A) Benzpyrene exposed through quartz ..	7, 8, & 8.
(B) " " " glass ..	15, 15, 16, & 19.
(C) " commercial, unexposed ..	28, 28, & 30.
(D) " purified in the dark ..	Above 60, inactive.
(E) Cholanthrene made in the light ..	19 & 22.
(F) " purified in the dark ..	Above 60, inactive.

TABLE III—TIME REQUIRED TO KILL COLEPS, USING A DILUTION OF 1 IN 20,000

	Min.
(G) Benzpyrene exposed through quartz	4.
(H) " " " glass	9 & 9.
(I) " commercial, unexposed	10 & 11.
(J) " purified in the dark	18 & 19.
(K) Cholanthrene made in the light	8 & 9.
(L) " purified in the dark	29 & 30.

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purpose a small sample of benzpyrene was purified in the dark by a commercial firm and Prof. Cook kindly purified cholanthrene in the dark, subjecting it to five different processes of purification. Colloidal emulsions (1 in 10,000) and watery extracts of these two samples (1 c.cm. equivalent to 1 mg.) were made in dull red light. The results of testing these are given in Table II (D and F) and in Table III (J and L).

Let us consider the colloidal preparations first (Table III). In the case of benzpyrene the ordinary commercial preparation (I) takes 10 and 11 minutes and the purified preparation (J) 18 and 19 minutes to kill coleps, and with cholanthrene (K and L) the figures are 8 and 9 and 29 and 30 minutes. The times therefore are doubled or trebled but the purified preparations are still active. It was not expected that these pure preparations would be entirely inactive because no doubt whilst coleps is being exposed in their presence to light oxidation products are formed which, in time, accumulate and kill the infusoria photodynamically, so that this test can only be expected to show a slower action. It is probably for this reason also that it is not possible to exhaust dry films or wash them so as to render them inactive; they are reactivated during subsequent tests.

This however is not the case with water-soluble extracts, and they should give negative results when tested if they have been prepared from pure hydrocarbons. In Table II the results obtained with purified benzpyrene (D) and purified cholanthrene (F) are in accordance with this prediction, for coleps remained active when exposed to the mercury lamp for more than 60 minutes in both cases. To decide whether a very feeble action was nevertheless present 13 c.cm. of the watery extract of cholanthrene and 6·7 c.cm. of the extract of benzpyrene were each reduced by evaporation to 1 c.cm. These highly concentrated solutions when tested gave readings of 26 to 28 minutes and 33 to 34 minutes. It follows that even in these purified preparations traces of impurities remain or are produced by the red light under which the watery extracts are made. It is therefore concluded that the photodynamic action of these hydrocarbons is due to light-produced soluble impurities.

DISCUSSION

As soon as the fact that blastogenic agents are photodynamic was established the question arose as to whether blastogenic and photodynamic actions were correlated. In Table IV a rough indication (+++, ++, +) of the carcinogenic activity of the hydrocarbons tested is set out beside their photodynamic activity taken from Table I. It will be seen that there is a considerable similarity in these activities, though there are exceptions in the case of 1 : 2-benzanthracene which is active photodynamically but a doubtful carcinogenic agent; 1 : 2 : 5 : 6-dibenzacridine which has a slight carcinogenic action but is inactive photodynamically; and anthracene and 1 : 9-dimethylphenanthrene which have a slight photodynamic action but no carcinogenic activity. But when consideration is taken of the very different biological actions compared—production of tumours in vertebrates and death of a protozoön by radiation—it is remarkable that there is any relation at all, and it would seem that the common factor may lie in biological bedrock and therefore be important. If the two actions have a common basis the oxidised impurities of these compounds appear to be the blastogenic agents and not the mother substances. Further experiments should speedily settle this question. As regards the part which light plays in the production of tumours by chemicals, four papers have been published (Findlay 1928, Lewis 1935, Maisin and de Jonghe 1934, Seelig and Cooper 1933, Vles and others 1935), but the results were discordant and indicate that the controlling factors have not yet been elucidated. Until these and other questions have been answered detailed discussion cannot be profitable.

TABLE IV—COMPARISON OF THE CARCINOGENIC AND PHOTODYNAMIC ACTIVITY OF VARIOUS HYDROCARBONS

—	Carcinogenic activity.	Photodynamic activity.
Cholanthrene	+++	+++
3 : 4-benzpyrene	+++	+++
Methylcholanthrene	+++	+++
2 : methyl-3 : 4-benzphenanthrene ..	++	+
1 : 2 : 5 : 6-dibenzanthracene	++	++
1 : 2 : 5 : 6-dibenzacridine	+	−
3 : 4-benzphenanthrene	+	++
1 : 2-benzanthracene	?	+++
Anthracene	−	+
Phenanthrene	−	−
1 : 9-dimethylphenanthrene	−	?
Fluorene	−	−
1 : 2-benzfluorene	−	−
Perylene	−	−
Cholesterol	−	−
Ergosterol	−	−
Cholesteriline	−	−

Carcinogenic activity: +++ = abundant tumour production; ++ = definite tumour production; + = tumours occasionally produced; ? = tumours rarely produced; − = no tumours produced. Photodynamic activity (see Table I): +++ = killed in 10 min.; ++ = killed in 20 min.; + = killed in 30 min.; ? = killed in 40 min.; − = not killed in 60 min.

CONCLUSIONS

1. The following blastogenic agents have been found to be photodynamic towards the infusorian coleps: tar, shale oil, soot.

2. A series of cyclic hydrocarbons have been tested for photodynamic action on coleps, some of these being blastogenic and some inactive in this respect. With few exceptions there was a correlation between their photodynamic and blastogenic activity.

3. The photodynamic action was obtained in all cases in the near ultra-violet region of the spectrum, between 330 and 410 $\mu\mu$.

4. Experiments showed in the case of those hydrocarbons tested—i.e., 3 : 4-benzpyrene, cholanthrene, and 1 : 2 : 5 : 6-dibenzanthracene—that this photodynamic action was due to water-soluble impurities in the hydrocarbons.

5. Further experiments showed that these impurities could be greatly increased by exposing the hydrocarbons to ultra-violet radiation, and that this also greatly increased the photodynamic activity of the hydrocarbons.

6. On the other hand, when the hydrocarbons 3 : 4-benzpyrene and cholanthrene were purified in the dark so as to free them from these impurities, their photodynamic activity disappeared or was very greatly reduced.

7. Attempts to cytolyse red cells were not successful.

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SIMULATION OF THE "ACUTE ABDOMEN" IN CARBON TETRACHLORIDE POISONING

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Two cases of carbon tetrachloride poisoning with signs and symptoms simulating the "acute abdomen" have been seen during the past two years.

Carbon tetrachloride has a widespread use in many industries. It is a solvent for gums, resins, and fats in certain chemical processes, the making of rubber and paint, dry-cleaning, and cleaning oil from machinery. In some countries it is used as a dry shampoo. It is also a constituent of a fire-extinguisher known as Pyrene, and carpenters make use of it for killing worms in wood. Medicinally it is used extensively in the treatment of ankylostomiasis.

It is an extremely volatile substance, giving off fumes of a heavy density which are highly poisonous. The provision of proper ventilation of the fumes in rooms where carbon tetrachloride in any form is in use has an importance which must be stressed. As a fire-extinguisher, pyrene is invaluable, but great care must be taken to avoid inhalation of the fumes when the extinguisher is used in an enclosed space.

Several cases of carbon tetrachloride poisoning in this country, and many in other parts of the world, are to be found on record. Some followed inhalation of the fumes; others the taking of the fluid in medicinal doses (2–3 c.cm.). So diverse are the symptoms produced that the cause may be easily overlooked. Their onset may be immediate, or delayed for several days. Children, debilitated individuals, and those who are addicted to alcohol are especially susceptible; no system appears to be immune from its action.

In the majority of the cases reported the gastro-intestinal system was affected. Many patients complained of a burning sensation in the epigastrium, and nausea or diarrhœa, with vomiting. In more severe cases abdominal colic and hæmatemesis were observed. Jaundice and hepatic enlargement were conspicuous features in several cases, but absent in others. Autopsies in several fatal cases showed necrosis of the liver cells, as in acute yellow atrophy or delayed chloroform poisoning. Nephritis of varying degree was common, and sometimes so severe as to produce a transitory anuria over several days; at post mortem, desquamation and necrosis of the epithelium of the tubules were present. Symptoms of irritation of the respiratory tract were often noticed; the eyes, nose, and throat were affected, and there was pulmonary œdema and broncho-pneumonia. Post-mortem examination revealed the alveoli filled with fresh blood. Some cases showed prostration with a rapid and thin pulse, pallor, sweating, and slight cyanosis.

In another group of symptoms, nervous phenomena were prominent. Some showed nervous irritability, restlessness, and headache without other manifestations. In others the symptoms were more severe, including alternating periods of consciousness and unconsciousness with drowsiness and mental confusion.

CASE RECORDS

The first of the two cases was brought to my attention by Dr. R. A. V. Llewys-Lloyd of St. Nicholas Hospital, Plumstead.

The patient, a man of 28, was admitted to St. Nicholas Hospital on May 15th, 1935, with a history of having been taken ill with abdominal pain about 8 o'clock the previous evening. He had vomited several times during the night and also on the day of admission. The pain had by this time radiated to the right iliac fossa. The past history was that, in his occupation as a helmet-maker, he used a solution which gave rise to fumes, and that he had previously had attacks of nausea and vague abdominal pains after working with this solution. He had no idea as to its nature.

The patient looked ill; his temperature was 100° F. and the pulse-rate 104. There was generalised abdominal resistance with diffuse tenderness, maximum tenderness being in the right iliac fossa. On these findings a diagnosis of acute perforative appendicitis was made and laparotomy was performed. Apart from a few terminal adhesions, the appendix appeared normal. The small bowel showed alternating lengths of collapse and distension, and with the mesentery was injected and œdematous.

For the next two days there was continued complaint of the abdominal pain with nausea. Routine examination of the urine revealed the presence of albumin. This albuminuria gradually increased during the succeeding two days, and then subsided. Microscopic examination of the urine showed epithelial cells, also very occasional hyaline casts. The blood-urea was within normal limits, and the van den Bergh reaction (indirect) less than 0·5 unit. By June 5th the albuminuria had cleared up completely. On June 16th the patient was discharged from hospital free from all symptoms. Further investigations and inquiries showed that the solution used by the patient in his work of making crash helmets contained over 60 per cent. carbon tetrachloride. The patient stated that, for the two or three days preceding the attack which brought him to the hospital, owing to inclement weather he had closed windows always kept open for the purpose of ventilation.

The second case was admitted to my ward by Dr. E. R. van Langenberg, with a provisional diagnosis of carbon tetrachloride poisoning.

The patient, aged 35, was admitted to St. Mary Islington Hospital on July 27th, 1935. He complained that at 6.30 A.M. on the day of admission he had a sudden onset of epigastric pain, which persisted and was accompanied by vomiting. The bowels were opened twice during the morning. He had been working as a dry-cleaner for the two preceding years. During the first six months his appetite had increased, but he had since noticed that after opening the cleaner on warm days he had nausea and no desire for food for about half a day. In the last week a valve in the cleaning apparatus had been leaking. The past history was that he had had acute appendicitis six years previously, for which appendicectomy had been performed.

He looked anæmic, the tongue was furred and dry, and the pulse very slow and thin. The abdomen moved well on respiration. There was definite tenderness and a degree of resistance in the mid-epigastrium, suggesting an active peptic ulcer. The

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rest of the abdomen was flaccid. Nothing abnormal was found in the other systems. Later on the day of admission he vomited bile-stained fluid. By evening the pain still persisted, the pulse had better volume, and the rate was increased. Next day the abdominal tenderness was more general and slight tenderness was noted in the left renal angle. By evening general abdominal pain and distension were present. On auscultation no peristalsis was audible. More tenderness in the left loin was noticed. Very little urine had been passed.

On the following day, May 29th, the abdominal distension and tenderness had further increased. In addition to the left loin tenderness there was some tenderness in the right loin. By evening the pulse had risen to 130, and was very thin. Retching was present. He had passed 10 oz. urine during the previous 24 hours. He had now the Hippocratic facies, and presented the typical appearance of general peritonitis. Only the increasing tenderness in the loins and the blood-cells in a scanty urine tipped the balance in favour of medical treatment for carbon tetrachloride poisoning rather than laparotomy for an acute abdomen. Accordingly, an intravenous injection of 10 c.cm. of 10 per cent. $CaCl_2$ was administered. On the following morning he looked much better: the pulse-rate had fallen to 104, and the pulse was of better volume; the abdomen was definitely less distended and less tender. The $CaCl_2$ was repeated. Slow but steady improvement followed and he was discharged, free of all symptoms, on Sept. 12th, 1935. It was found that the dry-cleaner consisted of carbon tetrachloride.

During the past year both cases have again been fully investigated, and neither patient shows signs of any abnormality.

COMMENT

Poisoning after administration of carbon tetrachloride as an anthelmintic, or immediately after exposure to the fumes, may be easily recognised as such. Again, when damage to the liver gives rise to jaundice some toxic factor is suggested as an explanation of the illness. But, in cases where the symptoms are abdominal, where there is no diarrhœa, and where the onset of these symptoms is delayed, differential diagnosis from the acute abdomen is more difficult. Further, as the kidney involvement does not show itself until after the onset of the abdominal symptoms, early diagnosis and avoidance of a laparotomy appears to depend on the history of exposure to the action of carbon tetrachloride, and appreciation of the condition it may cause.

The value of calcium therapy was demonstrated in the second case, where it brought improvement in less than twelve hours. In view of the rapidity with which our doubts in that case were dispersed by this specific, its administration can be regarded as a diagnostic measure, and it seems advisable therefore that the remedy be used as soon as any suspicion of carbon tetrachloride poisoning arises.

Both cases show the danger of inadequate ventilation where carbon tetrachloride is in use.

I wish to express my thanks to Sir Frederick Menzies, medical officer of health for the County of London, for permission to publish this article, and also to Dr. P. Hamill, consulting physician to the London County Council, for his invaluable help in both these cases.

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HÆMORRHAGE AND INTESTINAL OBSTRUCTION DUE TO A MECKEL'S DIVERTICULUM

By B. H. Page, M.B. Camb., F.R.C.S. Eng.

SURGICAL FIRST ASSISTANT AND REGISTRAR AT THE LONDON HOSPITAL

Meckel's diverticulum is subject to a number of diseases and the three most serious conditions that may be caused by it are intestinal obstruction, hæmorrhage, and peritonitis. A few months ago a case was recorded in The Lancet in which two of these conditions—namely, hæmorrhage and peritonitis—arose simultaneously from the bleeding and perforation of a peptic ulcer which had developed in an area of heterotopic gastric mucous membrane in a Meckel's diverticulum (Card and Mimpriss 1937). The following case may be of interest because it too exemplifies the occurrence in one patient of two serious complications of Meckel's diverticulum, but in a different combination; the patient suffered (on separate occasions) from serious bleeding and from intestinal obstruction.

CASE RECORD

On May 5th, 1937, a single man aged 23, a warehouseman, was admitted to the London Hospital suffering from profuse rectal bleeding of three days' duration; the blood was dark and congealed. There had been no abdominal pain and no other symptoms. Previously he had been healthy except that in December, 1936, he had had an attack of severe lower abdominal pain lasting a few hours and unaccompanied by diarrhœa or vomiting or blood in the stools. He had not suffered from indigestion.

No abnormal physical signs were found except those associated with the loss of blood; his hæmoglobin was 29 per cent. He was treated by blood transfusions and large doses of iron and steadily recovered. Subsequent radiological examination of stomach, duodenum, and colon showed no abnormality. The gastric acidity was rather high, the free HCl being 0·26 per cent. in the resting juice and 0·09 per cent. one hour after the test-meal.

After five weeks in hospital he was discharged to the out-patient department where he attended periodically until Nov. 25th when, as he had consistently been free from symptoms, he was discharged; but while he was on his way home from hospital (he remembers that he was opposite Stepney Green Station) he was suddenly seized with severe central abdominal pain which remained continuous

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but was increased at intervals by more violent spasms which spread all over the abdomen. He vomited about six times bringing up small quantities of green fluid. His bowels had been opened that morning as usual but after the onset of the pain he had passed nothing per rectum. He was admitted to the London Hospital about seven hours after the symptoms began.

On examination he was found to be rather shocked and obviously in pain. Temperature 97° F., pulse-rate 80. The abdomen looked normal and there was no visible peristalsis. There was no rigidity but there was slight tenderness, mostly to the right of the umbilicus. No lump could be felt. The hernial orifices were clear and rectal examination was negative. Two enemas were both returned without flatus and with very little fæcal result. The diagnosis was acute intestinal obstruction, probably involving the small intestine, but from cause unknown, and laparotomy was performed 10 hours after the onset of the symptoms. A right paramedian incision was made at the level of the umbilicus. There was slight excess of clear free fluid in the peritoneal cavity. Distended coils of gut led to a large Meckel's diverticulum which was attached by its blind end to the umbilicus and was twisted several times in its long axis so that it was strangulated and almost gangrenous and had caused a slight twist and kink of the ileum at its point of attachment. It was excised with a small fringe of ileum and the latter was then sutured transversely. The diverticulum was very vascular and there was a little trouble from hæmorrhage. The appendix was also removed as it was high, kinked, and adherent. The patient made an uninterrupted recovery. There was no vomiting. He was fed only by the mouth. Four days after operation the bowels were opened with an enema. He left hospital on the 17th day with a soundly healed wound.

The excised diverticulum (see Figure) was 4½ in. long and consisted of a proximal cylindrical part and a bulbous extremity; it was deep purple throughout. From the bulbous end ran a cord of tissue which had been attached to the umbilicus. The mucosal surface of the distal part was of a much coarser texture than the proximal, having the appearance of rugæ, and the two parts were separated by an annular ridge projecting into the lumen. There was no obvious scar or ulcer to be found.

Microscopical examination showed almost complete hæmorrhagic necrosis. The proximal part was lined by mucosa of small intestine type and the distal by mucosa such as is found in the body of the stomach; there was no microscopical evidence of scarring or ulceration. The cord of tissue running from the bulbous end had a core of smooth muscle, blood-vessels, and a nerve.

REMARKS

Meckel's diverticulum is found in about 2 per cent. of people, most commonly in males. Occasionally its blind end remains attached to the umbilicus (as in the case here described) by a cord of tissue which represents the omphalomesenteric duct. More often the blind end gains a secondary attachment to the mesentery of the small gut; occasionally it is free. Usually the diverticulum is lined by ileal mucosa but heterotopic elements are often found (Schaetz 1925), the most common being pancreatic and gastric.

Intestinal obstruction may be caused in a variety of ways (Halstead 1902) by a Meckel's diverticulum whether its blind end is free or attached. Some of the more common ways are as follows:—

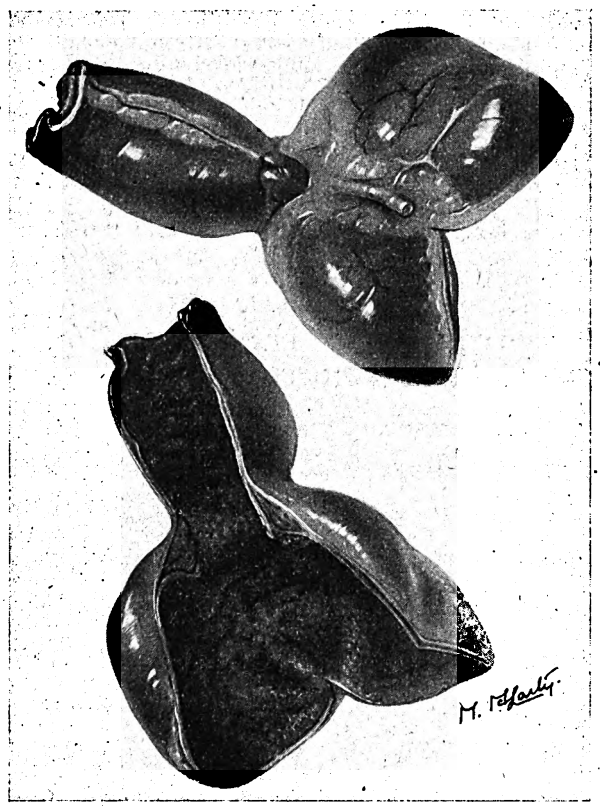
(1) The diverticulum may be invaginated and cause an intussusception.

(2) It may act as a band, ring, or noose over or through which a loop of gut becomes strangulated.

(3) Volvulus of a loop of gut may be caused.

(4) The gut may be kinked or twisted at its point of attachment to the diverticulum (Taylor 1901).

It was the last type of mechanism that caused the obstruction in the case recorded above. The volvulus of the diverticulum had shortened it, drawing its base up from the pelvis towards the umbilicus, thus slightly twisting and kinking the ileum. The actual mechanical obstruction was incomplete, but in such cases, as in Richter's hernia, a reflex paralysis of the gut originating in the strangulated part (in this case the diverticulum) is probably a very important factor in completing the obstruction.



Drawings of the excised diverticulum.

Meckel's diverticulum is a well-recognised though relatively uncommon source of serious intestinal hæmorrhage, chiefly in children and young adults (Gabriel 1937, Cobb 1936). The usual source of the bleeding in such cases is a peptic ulcer associated with heterotopic gastric mucosa in the diverticulum. The conditions here are ideal for the development of peptic ulceration and are, in fact, almost exactly similar to the conditions governing the formation of gastrojejunal ulcers or the ulcers produced in the classical experiments of Mann and Williamson; the ectopic "gastric" glands in the diverticulum pour unneutralised and undiluted acid juice on to the adjacent ileal mucosa. In some cases of intestinal bleeding associated with Meckel's diverticulum no evidence of ulceration, past or present, can be found at the time of operation (Farr and Penke 1935). At least two explanations of such cases may be offered. The ulcer may have healed, leaving a scar so slight that it cannot be found. Secondly, the ulcer may not have been excised with the diverticulum, for it is known that such ulcers commonly occur at the junction of the diverticulum and intestine; or, by analogy with gastrojejunal ulcers, they may be

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found a short distance down the ileum quite separate from the diverticulum. In the case described above the patient had suffered from severe intestinal bleeding six months before the diverticulum was removed. The kind of bleeding was typical of that from the lower intestine and investigations had failed to show any other cause. The discovery, therefore, at operation of a very vascular diverticulum containing gastric mucosa may reasonably be taken as providing the explanation of the hæmorrhage even though no ulcer or scar was found.

I am indebted to Sir James Walton and to Dr. George Riddoch for permission to publish this case; to Drs. W. W. Woods and J. R. Gilmour for the report upon the histology; and to Prof. H. M. Turnbull for helpful criticism.

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THE EFFECT OF TESTOSTERONE PROPIONATE ON TESTICULAR FUNCTION IN MONKEYS

BY S. ZUCKERMAN, D.Sc. Lond., M.R.C.S. Eng.

(*From the Department of Human Anatomy, Oxford*)

THE view that spermatogenesis can be either maintained or stimulated by synthetic male hormones has been advanced in several recent laboratory publications. Interest in this question was first aroused by the observation of Walsh et al. (1934) that a fat-soluble extract of male sex hormone can prevent the testicular atrophy which in rats normally follows hypophysectomy. This finding has been confirmed by Nelson (1937) and by Nelson and Gallagher (1936) using crystalline male hormones, but according to them the experiment fails if treatment is begun many days after the removal of the pituitary.

As is widely recognised, spermatogenesis does not occur if proper scrotal conditions are lacking. Cutuly et al. (1937, 1938) therefore argue that the maintenance of spermatogenesis by androgenic substances after hypophysectomy is not due to any direct effect of the hormone on the testis but to the fact that these substances prevent atrophy of the scrotum. This view is denied by Nelson and Merckel (1937), who point out that the degrees to which scrotal and testicular function are maintained by androgenic substances after hypophysectomy bear no relation to each other. Thus testosterone, while promoting scrotal function, does not successfully maintain the testes, whereas the opposite effects are seen when the hormone used is androstanedione. Nelson and Merckel are therefore inclined to believe in a direct action of the hormone on the germinal epithelium.

Such a direct effect is perhaps also suggested by the experiments of Wells and Moore (1936) who observed testicular descent and spermatogenesis in immature and "anœstrous" mature male ground-squirrels injected with androsterone. Goldschmidt and Streber (1937) report a similar result in four-week-old rats that were given 20 mg. of testosterone propionate over a period of four weeks. Their observation conflicts, however, with that which Korenchevsky et al. (1933) and with that which Moore and Price (1937) obtained when young rats were injected with androsterone. According to Itho and Kon (1935), too, androsterone not only fails to stimulate spermatogenesis in young dogs but also retards testicular development. This finding is in keeping with Bottomley and Folley's observation (1938) that the size of the testis in the guinea-pig decreases as a result of the administration of various crystalline androgenic substances.

Since androgenic hormones are being increasingly used in the treatment of hypogonadism, and since it has been suggested (Lower et al. 1937) that they should be tried in the treatment of masculine sterility, the possibility that these substances promote spermatogenesis becomes very important. The fact that they do not appear to have any such action in monkeys is accordingly of clinical interest. Observations were made on eight immature rhesus macaques (*Macaca mulatta*), one drill (*Mandrillus leucophæus*), and two Hanuman langurs (*Presbytis entellus*). The rhesus monkeys were given up to 400 mg. of testosterone propionate over a period of two weeks, the drill was given 5 g. of the same preparation over a period of 191 days, while the two langurs were given 2 g. and 1 g. for periods of 157 and 142 days respectively. Adequate control material from normal immature, adolescent, and mature monkeys was available for comparison. The testicular lobules appear to be closer together in the injected specimens, and the seminiferous tubules in the three animals which received the hormone for prolonged periods are more distended than is normal in young animals. The germinal epithelium in these tubules is however immature in disposition and no tubules contain spermatozoa. No changes were observed in the interstitial tissue.

The preparation given these animals is the same potent male hormone that is being widely used clinically, and in view of these negative results it is of interest that relative to their body-weights some of the monkeys received much larger doses than are likely to be given in clinical practice, while others received low doses for long periods. If, therefore, clinicians act on the guarded advice given by Lower and his colleagues (1937) to try androgenic substances in the treatment of masculine sterility, it would be advantageous to experiment not only with testosterone propionate but with other compounds of the androsterone-testosterone series.

The work reported in this paper was supported by a grant from the Nuffield Committee, Oxford. The monkeys were bought with the aid of a grant from the Medical Research Council, while the testosterone propionate was kindly provided by Dr. K. Miescher of Messrs. Ciba Ltd.

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A SIMPLE ELECTRICAL DEVICE FOR TAKING THE FOURTH ELECTROCARDIOGRAPHIC LEAD

By Adolf Schott, M.D. Heidelberg, M.R.C.S. Eng.
Clinical Assistant, Guy's Hospital, London

The use of precordial leads is one of the most important recent advances in electrocardiography. By means of the button type of electrode I have for the last few months been taking the fourth lead as a routine measure and have registered all four leads on a plate 7½×5 in., fitted to an old type of Cambridge electrocardiograph. I would like to draw attention to a simple electrical device whereby it is possible to apply and connect all four leads at once, thus saving inconvenience for the patient and time for the operator.

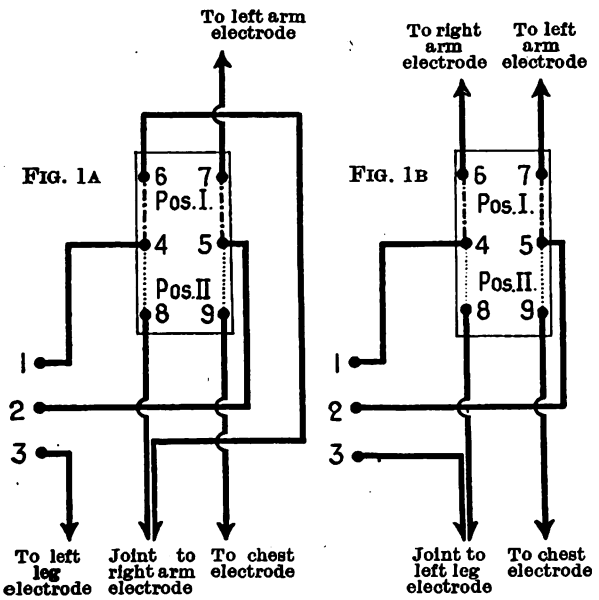

Diagram showing the connexions of switch. 1, 2, 3: terminals for the three leads on control board of electrocardiograph. 4–9: terminals on switch. Position I marked -·- -·- - connecting 4 with 6 and 5 with 7 for taking the standard leads; position II marked ..... connecting 4 with 8 and 5 with 9 for taking chest lead.

FIG. 1a.—Connexions for Roth's lead, indifferent electrode right arm.

FIG. 1b.—Connexions for indifferent electrode left leg.

The chest electrode was placed in the 4th intercostal space about 1 cm. to the left of the sternal border; for the indifferent electrode the left leg was used first and subsequently the right arm according to the technique of Roth (1935) recommended by Hall (1937). With either of these indifferent electrodes essentially the same record of the ventricular complexes, initial and final, is obtained, but Roth's lead has the advantage in that the P waves are upright and well defined.

If it is desired to obtain the record of the chest lead symmetrically with the standard leads the polarity of the circuit of the chest lead has to be reversed as compared with the original procedure introduced by Wolferth and Wood. All that is required is an ordinary double-pole double-throw switch which can easily be fitted on to the control board of the standard model of the Cambridge electrocardiograph. The connexions are made according to the accompanying diagram. The three standard leads are taken in the ordinary way, the additional switch being in position I; Lead 4 is then taken by switching over the additional switch to position II, the lead selector on the control board being in the position for Lead 1. Thus by means of switching back to the original position the instrument is ready for taking Lead 1 of the next patient and there is no risk of the lead selector being accidentally left in any position other than Lead 1.

If the chest lead is always confined to Roth's lead a more simple arrangement is sufficient—namely, a single-pole double-throw switch connecting the Lead 2 terminal of the control board with the left arm or with the chest electrode respectively. The new paper camera of the portable model proved also useful for taking the four leads, position "O" of the lead indicator being used for indicating the chest lead.

With these arrangements I have taken 258 records of 211 patients. The results will be published in *Guy's Hospital Reports*.

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MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE

SECTION OF OTOLOGY

At a meeting of this section held on May 6th, with Mr. Eric Watson-Williams, vice-president, in the chair, a discussion on the pathology of

Ménière's Syndrome

was opened by Prof. Hugh Cairns and Mr. C. S. Hallpike.

Prof. Cairns described the history and clinical condition of two cases of Ménière's syndrome, both males. The first patient, aged 63, had suffered from mild attacks for three years before admission. These had increased in severity and had sometimes been associated with falling. He had been treated, with slight relief, by Eustachian catheterisation and sedative drugs, but eventually was discharged from his work as a dock labourer on account of attacks. In the severe attacks sight had failed temporarily and he had been obliged to sit or lie down. While recumbent he felt no rotation or movement of the ground, but had a sensation as though he were staggering about. There was no vomiting nor diplopia. The attacks lasted for about half an hour and were followed by quick recovery. A year before the attacks had begun he had become progressively deaf in the left ear, with drumming noises. There was no aural discharge, but dry wax had come from the left ear and he had been deaf in the right. Examination showed a fine nystagmus to the right but no impairment of the general nervous system. Both ear drums were retracted, the left more than the right. There was considerable loss of hearing. There was no response on the left side to the cold caloric test; on the right it produced nystagmus to the left for 20 seconds, but no vertigo.

The second patient, aged 28, had had attacks for four years before admission. These had been quite moderate until the last four months, when he had

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been obliged to give up his work as an engineer. During the attacks he had had a feeling of eye-strain, and objects appeared to quiver and finally to rotate. He could, however, read and walk steadily. He had vomited in the earlier but not in the later attacks, although he had been nauseated. The violent attacks had given little or no warning; objects would whirl rapidly and he would sink to the floor, but not lose consciousness. The rotation would pass off in a few seconds but he would have to lie still for half an hour and could not resume work for an hour and a half. They took place about once a month. As a child he had had earache but never aural discharge. At the time of the onset in 1932 he had noticed that the hearing of the left ear was impaired. It had gradually become worse, especially after the onset of the violent attacks. There was also a continuous slight surging noise in the left ear, increasing during the attacks to a ringing. A month before admission ringing noises had developed in the right ear. On examination the ear-drums had been found normal and the eyes had shown nystagmoid jerks to the left. After treatment with large doses of Luminal the attacks had become less frequent and he had returned to work, but he felt drugged and had an attack in front of a prospective employer.

Prof. Cairns had operated on both patients, dividing the left eighth nerve, but both had subsequently shown signs of increased intracranial pressure, and in spite of reopening of the wound and decompression of the foramen magnum, both had died.

Mr. Hallpike then described the histological findings. He said that recent papers by two authorities—A. J. Wright, and S. J. Crowe of Baltimore—had agreed closely in their clinical identification of a common type of cause for this syndrome, and in postulating the action upon the labyrinthine end-organs of a single pathogenic agent. Wright said that this was a focal labyrinthitis; Crowe was less specific, and spoke of a disturbance of normal conditions of pressure and chemical constitution of the endolymph. A third possibility, suggested by other workers, was that the condition was due to a neuritis of the trunk of the eighth nerve. He and Prof. Cairns favoured the view that a considerable proportion of patients with this syndrome were recognisable upon clinical grounds as the victims of some common order of pathogenic agent which acted within the labyrinth. Clinical observation alone should exclude cases of acoustic neuroma and traumatic encephalitis. The present cases could be classed, from their empirical features, within the clinical group identified by Wright and Crowe. The description of the anatomical changes in the temporal bone was perhaps the first of its kind to be given.

Histological preparations showed gross dilatation of the endolymph system, degeneration of Corti's organ and the stria vascularis, pathological elevation of the otolithic membrane of the utricle, and, in the first case but not in the second, in both ears a symmetrical chronic inflammatory condition of the middle-ear mucosa. These changes represented a reaction of the labyrinth either to direct trauma or to toxins reaching the internal ear through the round window membrane or by the blood. It might be justifiable to interpret the present tissue changes as representing a serous labyrinthitis—the "hydrops labyrinthi" of Witmaak. Although there was no decisive objection to such an interpretation, and although the changes in Corti's organ might possibly represent some undescribed stage of serous labyrinthitis, they did not show some of the features which were commonly described as typical of the condition. In the ordinary case it was unusual to see such a uniform and extreme dilatation of the endolymph system. It therefore seemed logical to consider the possibility of some disorder in the mechanism of the endolymph.

Mr. Hallpike described the anatomy of the saccus endolymphaticus. The endolymph, he said, had been shown to come down the duct, pass through the wall of the pars intermedia, and be absorbed into the perisaccular connective tissue. In eleven out of thirteen normal cases the loose perisaccular connective tissue had shown a well-marked development. In the other two cases, however, the tissue had seemed to be very poorly developed and the epithelium had been brought into direct relationship with the dense material of the surrounding dura mater. Both the present cases, he thought, belonged to this abnormal group. There might have been a hypersecretion of the endolymph which had led to the obliteration of the tissue by pressure. This, however, seemed unlikely, for the same appearances had been present in the unaffected ear of the first patient. The suggestion therefore arose that the dilatation of the saccus endolymphaticus had been brought about, at any rate in part, by some disorder in the mechanism of the fluid absorption of the endolymph, of which the morphological evidence was the absence of the normal absorption area of the perisaccular connective tissue. As this tissue had also been found absent in two of the normal cases, its absence could not be described as more than a predisposing anatomical variation. The primary factor might be either a hypersecretion of the endolymph, or a more inscrutable type of alteration in its chemico-physical constitution.

The most interesting speculation from the purely clinical point of view was to explain in terms of these anatomical changes the most dramatic feature of the disease: the paroxysmal disorder of labyrinthine function. If there was an increase in the volume of the endolymph, there would be a dilatation of the elastic membranes and a displacement down the aqueduct of the cochlea and the helicotrema of a corresponding amount of perilymph. The pressure change in the system as a whole would ordinarily be negligible. In the present cases, however, the elastic membrane was being backed on to the bony walls of the cavity. Reissner's membrane was pushed back and stretched, and this relatively confined area represented the last remaining area of elastic expansion. Pressure response to any further sudden increase in the volume of the endolymph would be very considerable. In other words, once the dilatation had reached its maximum the system would become extremely sensitive in its pressure response. The attacks might thus be due to rapidly increasing bouts of asphyxia in the labyrinth end-organs brought about by a sudden rise in pressure due to an increase in the volume of the endolymph. Before this crisis was reached, however, the system must be dilated in the labyrinth to the limits of its bony walls.

DISCUSSION

Mr. S. R. Scott declared that these case reports were invaluable and their like had not been seen since the foundation of the section. No doubt many changes in histological preparations were artefacts. Moreover, these sections were not all absolutely vertical to the ciliary cell. Some sections taken from the ears of deaf-mutes showed a reverse appearance—the perilymph displaced at the expense

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of the endolymph. In those cases the vessels of the membrana vasculosa seemed to have undergone atrophy; in the present cases the membrane had not degenerated but some change might have taken place in its vessels to give excessive secretion on the one hand and diminished absorption on the other. The explanation threw light on other cases in which changes of pressure in the internal ear caused momentary attacks of vertigo. On the other hand, attacks of vertigo could take place without any changes in the internal ear.

Mr. F. W. WATKYN-THOMAS declared that this was an historic paper, describing a unique condition. Depression of the endolymph space was much more common in sections. He could not see how this dilatation, which was so constant through the sections, could be an artefact. The findings fitted in with the results of drainage of the saccus endolymphaticus, and with the results of Musgrave Woodman, who in a number of cases of vertigo had obtained relief by stripping up the dura and rupturing the ductus endolymphaticus.

Mr. A. J. WRIGHT said that this work had for the first time established the major fact that certain cases of aural vertigo were labyrinthine. The present two cases were absolutely typical of the vast majority of severe cases of aural vertigo. He asked whether the findings were inconsistent with an inflammatory lesion. He did not regard these cases as due to a bacterial infection of the labyrinth; it was affected by some deleterious product of organisms in another part of the body. The term "inflammation" was, however, correctly applied to a tissue reaction to the products of organisms. He was convinced that these cases formed a clinical group and were due to focal infection.

Mr. F. C. ORMEROD asked whether Mr. Wright distinguished incapacitating vertigo from lesser attacks. Both these patients had been judged bad enough for a dangerous operation. If they were not in a separate group, were they in an advanced stage which might be reached ultimately by patients with ordinary mild symptoms of vertigo? Incapacitating vertigo must be quite rare; in the old Ministry of Pensions scale it had ranked as 80 per cent. disabling, but he had never seen a case he would have called "incapacitating."—Mr. WRIGHT answered that he saw a distinct clinical picture in the severe cases.

The CHAIRMAN inquired whether death had been due to cerebellar œdema, caused by trying to lift the cerebellum too rapidly. The authors' ingenious theory overcame the obstacle of explaining how a chronic inflammation could by itself give rise to paroxysmal attacks of vertigo with intervals of apparent freedom.

Mr. T. B. LAYTON suggested that therapy should be directed to other parts of the body before resorting to a destructive operation. He demurred at the indiscriminate use of the name "Ménière." That authority had originally described a case of sudden acute illness after exposure and death with intense giddiness. His name was now being used by persons who were not otologists to describe every case of giddiness. A more correct term should be found for a disease which, according to the researches of Dan McKenzie, was quite different from the condition to which otologists applied the term.

REPLY

Prof. CAIRNS said that in each case a cerebellar œdema had been brought on primarily by an increase in the amount of fluid in the posterior fossa. He had been accustomed to fill up the space with Ringer's solution to bring the pressure back to normal, but he ought to have left the pressure slightly negative. An excess of cerebro-spinal fluid had been secreted in response to the irritation, and a vicious circle had been initiated: raised pressure, cerebellar œdema, secondary hæmorrhage, greater intracranial pressure, greater venous pressure, and finally pressure on the bulb. W. E. Dandy had done 200 of these cases without a death. He would like to see a re-examination of the whole of the clinical situation with the object of defining more precisely aural vertigo, Ménière's syndrome, or whatever other terms were preferred. One of the first necessities was to collect reliable data on vertigo due to various disturbances in the external and middle ear, confirmed by follow-up over a period of years.

Mr. HALLPIKE said that the serous labyrinthitis often seen after trauma or suppuration of the middle ear was a different condition.

Vertigo treated by Destruction of Labyrinth

Mr. WRIGHT then read a paper on the technique of destroying the labyrinth by injecting alcohol through the oval window. This method, he said, had been satisfactory in all the fifteen cases of vertigo in which he had used it, and was simple and safe. The use of too much alcohol would produce permanent facial palsy. He used one minim, in a special syringe fitted with a trigger action. The needle was long and bent at an angle; the point was filed off square to make it slightly blunt, for the resistance was a useful guide to the sense of touch. He had practised on the cadaver and on a rubber model, and had soon acquired the ability to distinguish the spot where the needle-point entered the foot-plate of the stapes and went forward about two millimetres. He insisted on a general anæsthetic. He used a square screen covered with non-reflecting black cloth, with a hole in the middle for the patient's ear. This enabled him to darken the surroundings of the ear and focus a point of light on the field of operation. A white line drawn vertically across the screen corresponded to Reid's base line and helped the operator to locate the oval window. By a series of readings through a speculum fitted with a cross-wire corresponding with Reid's base line, he had worked out that a line drawn through the short process of the malleus and through the foot-plate of the stapes would cut Reid's line at an angle of about fifteen degrees. He used no preliminary preparation, as he considered absolute alcohol a perfect safeguard. Patients suffered from violent giddiness and nystagmus immediately after the operation, and from sickness and malaise for two or three days, but could usually be allowed up on the sixth day. They should be encouraged to return to activity as soon as possible, to minimise functional derangement.

Mr. E. D. D. DAVIS said he saw no objection to the procedure, and a division of the auditory nerve could be performed afterwards if necessary.

Mr. R. A. WORTHINGTON asked how the surgeon could determine the need for intervention, and how the oval window could be located in a patient who had had a radical mastoid operation.

Mr. W. S. THACKER-NEVILLE declared that the amount of alcohol was the important point, by whichever route it were injected, if a facial palsy were to be avoided. He had cured aural vertigo

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by withholding salt and fluid. Each case must be considered separately.

The CHAIRMAN referred to the numerous cases in which the vestibular nerve had been divided without sacrificing hearing. In most patients, however, the ear was fairly deaf to start with. The most awkward problem was presented by a patient with a deaf ear and with a good ear which was causing vertigo.

Mr. SCOTT said that one patient he had treated in this way had suffered from facial paralysis which had since disappeared; another had contracted otitis media in the ward and had died of meningitis. It was therefore a dangerous treatment, but might be worth following up in carefully selected cases.

Mr. WRIGHT, replying, said he would sooner have the operation than (say) two years' vertigo. He had never known it cause tinnitus; actually most patients had the symptom before.

SECTIONS OF PSYCHIATRY AND NEUROLOGY

AT a joint meeting of these sections held on May 10th with the president of the Section of Psychiatry, Dr. EDWIN GOODALL, in the chair, a discussion on the

Presenile Dementias

their symptomatology, pathology, and differential diagnosis, was opened by Dr. W. MAYER-GROSS. It was important, he said, to contrast personality with the functions of memory and intelligence, its tools, but it was also important to note their interaction and interdependence. Even in organic psychoses the constitutional features might for a considerable time cover the clinical picture, especially when the specific symptoms were only negative in the sense of Hughlings Jackson. Some authorities considered that presenile dementias arose only on a constitutional soil. Failing intellectual control often led to exacerbation of the personality features—e.g., religious conversions and matrimonial crises in middle-aged persons might be the first premonitory signs of presenile deterioration. The second important factor was the phase of life in which the dementia occurred. The melancholic and paranoid forms of psychosis frequently occurred at the involutional or presenile period. Cases of severe depression, anxiety and restlessness leading to gross deterioration had been classified by Kraepelin as one of his presenile groups.

The influence of cerebral localisation on the clinical picture could scarcely be disputed. Focal distribution had great diagnostic value. In the initial stage of Pick's disease, atrophy of the frontal lobe appeared to go with hilarious over-activity and lack of affective control. In frontal cases the higher forms of reasoning were disturbed, but the simpler and more automatic forms of intelligence were relatively unaffected. If there were atrophy of the temporal lobe, an atypical aphasia often dominated the clinical picture. Logorrhœa might be observed. Localising signs were not very pronounced in Alzheimer's disease, but could be analysed by careful investigation. Much more work was needed to elucidate the diffuse focal symptoms in that psychosis. Generally speaking, Alzheimer's was a disease of the posterior part of the hemispheres, Pick's of the anterior, and this distinction might be of use when the focal signs were less pronounced. Allowance had to be made for progression in both diseases. Complications of endogenous or functional psychoses with presenile processes but not dementia were observed, and then the components might be disguised.

The presenile dementias included more than the diseases named after Alzheimer, Pick, and Jacob-Kreuzfeld, for many cases could not be included under any of these classes. Of the groups distinguished by pathological findings, Pick's disease was the rarest. Alzheimer's was much more common, but, as the pathologist had difficulty in differentiating it from simple senile dementia, so had the clinician from cerebral arterio-sclerosis. It might be distinguished in the first stage by the patient's defects of memory and attention, neglect of personal appearance, incapacity in walking, and apathy. Epileptiform seizures were sometimes observed in the later stages, but incessant restlessness, plucking movements, and severe disturbances of sleep were more characteristic. Emotional reactions were relatively little impaired but the insight disappeared early. The origin of the morphological changes in the brain was obscure. Knowledge of the general physiology of old age should be applied to neuropsychiatry. The genetics of presenile dementia had as yet only been studied in relation to the familial incidence. Further progress might be achieved by studying them in relation to the hereditary factors in longevity and in early and late senility.

Dr. MACDONALD CRITCHLEY recalled a similar joint discussion which had taken place six years ago but had been practically limited to a mere description by successive speakers of the clinical features of the Pick and Alzheimer psychoses. The rarity of both conditions should be emphasised; they were insignificant members of the heterogeneous group of presenile dementias. A useful purpose would be served by some sort of classification, to relegate these rare forms to their true perspective. There would obviously be an overlap between the presenile dementias and many of the organic psychoses. He suggested the following as a basis: syphilitic dementias; arterio-sclerotic dementias; a traumatic group; a neoplastic group; the epileptic dementias; a group of secondary dementias supervening upon chronic psychotic or psychopathic states; a group of dementias complicating chronic neurological disorders; a toxic infective group; and specific dementias of unknown origin—e.g., Pick, Alzheimer, possibly presbyophrenia, and many others. The arterio-sclerotic dementias were the least common, and after them the syphilitic. Differential diagnosis was not always simple, and he was still sceptical about whether either Pick's or Alzheimer's disease could be positively diagnosed during life. If a familial occurrence could be traced, Alzheimer became the less likely.

Among recent clinical advances the work of Goldstein on the activities of patients with organic brain diseases had been outstandingly useful, especially in his contribution to the problem of aphasia. His attitude was essentially positive: an inquiry into the means by which the healthy parts of the brain contrived to act. He had based his conception mainly upon the Gestalt hypothesis, and was therefore handicapped by its obscure terminology. He had pointed out that the patient's behaviour could not be merely described in terms of plus or minus, for a patient might succeed in a task on one occasion and fail entirely on another, or have varying difficulty. When a patient was confronted by an impossible task he became distressed, dazed, and agitated, he fumbled and changed colour, his pulse became irregular, and a "catastrophic situation" developed.

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A complex adjustment of the organism would take place therefore to defend it against such a situation, and would include subjective or objective withdrawal from the environment in a search for tranquillity. This motive partly explained the apparent apathy, lack of coöperation and confusion of demented patients, and their careless habits and inattention. Other defence mechanisms were extreme verbosity, hyperkinesis, and excessive orderliness. Goldstein believed that the degree of such adaptation was directly proportional to the severity of the disease. The dement in the early stages also typically lost his power of abstract thought and behaviour and could only deal with the concrete. Such work gave the psychiatrist an insight into many apparent inconsistencies. Goldstein's observations were mainly directed to patients afflicted with focal lesions of the brain, but his approach might be extended with advantage to early cases of dementia in which the cerebral lesions were multiple or thinly spread over the hemispheres.

Dr. J. G. GREENFIELD expressed the opinion that the most satisfactory classification would be based wholly on ætiology, but several forms of progressive lesion of brain tissue causing dementia, the cause of which was unknown, could be differentiated histologically. In the most commonly described forms of vascular disease there was little difficulty in tracing both the cause and the effect. The arteries of the base showed diffuse sclerotic changes, and multiple areas of cortical destruction or softening of the white matter could be observed—the latter particularly in Binzwanger's subcortical encephalopathy, in which presumably the longer arteries piercing the white matter were alone affected. In another form of vascular disease there was often no evidence of disease of the basal arteries or of the larger arteries in the sulci, although there was usually some degree of hyperpiesis, possibly due to renal disease. Two types of vascular disease could be distinguished in which there was no evidence of damage in the vessels of the base: cases with areas of paling, and cases with granular or verrucose atrophy of the cortex. The former was the more difficult to diagnose, and the condition was probably closely allied to that described by Kraepelin as the cause of the presenile psychosis. According to recent work it was the basis of epileptic idiocy, in which condition the areas of paling might progress to a more severe loss of nerve-cells or even to partial destruction of the cortex. Granular or verrucose atrophy might affect only a few convolutions or be very widespread. In association with slowly growing tumours, mental symptoms might predominate from the outset, chiefly gliomata of the corpus callosum or tumours of the third ventricle causing hydrocephaly. Tumours beginning in the medial nucleus of the thalamus had been said to be associated with dementia. Cerebellar degeneration was also associated with progressive dementia. The pathological changes in the cortex consisted of diffuse loss of nerve-cells which might be difficult to assess. In some cases definite degenerative changes had been found in the large pyramidal cells.

Dr. ALFRED MEYER described his personal observations on two cases of the Jacob-Kreuzfeld syndrome. It was characterised clinically by a mixture of subcortical extrapyramidal, pyramidal, and even peripheral motor phenomena, and pathologically by degenerative lesions in the cortex, basal ganglia, brain stem, and, in several cases, the spinal and anterior horn cells and their equivalents in the medulla. The psychosis was a progressive organic dementia often exhibiting marked catatonic and paranoid features. In view of the wide distribution of the lesions, cases varied considerably, and there was no really significant criterion of the pathological process. It was said to be degenerative and lacking in inflammatory or gross vascular lesions. Apart from the distribution, there was nothing which clearly delineated these cases from other so-called degenerative conditions, and it was even doubtful whether they formed a nosological entity. The group, however, undoubtedly existed, and might be accepted as a provisional scheme of heuristic value.

Dr. MACKENZIE STEWART described the case of a woman of 54 with a history of chronic alcoholism with a marked motor apraxia. At post-mortem examination no very obvious macroscopic changes were found in the intact brain, but on division it had revealed marked degeneration of the corpus callosum, especially in the anterior third. This case might, he considered in retrospect, have been one of primary degeneration of the corpus callosum. All the cases hitherto described had been in Italians and alcoholics and none had been reported in this country. In the light of recent work on alcoholic neuritis it might be suspected to be a deficiency disease. Pick's disease was also a degeneration of the corpus callosum, but included demyelinisation. The distinction between Pick's and Alzheimer's diseases was very difficult, and in most cases encephalography was necessary.

Dr. C. P. SYMONDS remarked that the neurologist saw such of these patients as presented epilepsy or focal symptoms, but not, as a rule, symptoms of increased intracranial pressure. The three common possibilities that entered the mind were arteriosclerosis, cerebral syphilis, and cerebral tumour. The first was not likely if the blood pressure were normal. The second sometimes occurred in a patient with no other manifestation but a positive Wassermann reaction. The remaining alternative was between cerebral tumour and presenile dementia. In a fair proportion of cases recourse must be had to encephalography, which would often give great help. If a tumour were large enough to produce severe organic dementia, it would generally have deflected the ventricles. In Alzheimer or Pick the skiagram would either show normal ventricles or a large ventricle on one side or the other. It would in most cases assist in the solution of the stock problem of neurology: to avoid missing anything curable.

Dr. A. A. W. PETRIE said the traumatic aspect of the history was apt to be obtruded on the physician by the patient, especially in a compensation case. Occasionally a small tumour, such as an oligodendroglioma, might cause a picture resembling an idiopathic dementia. The signs of arterio-sclerosis were sometimes masked even in a severe case. In some patients the confusion cleared up to a considerable extent and the permanent damage might be overestimated. A continual watch ought to be kept for the patient who was skilful at hiding his dementia.

Dr. ANTONY FEILING (president of the section of neurology) declared that the traumatic cases, though rare, were quite definite. The causation of the dementia and the precise manner in which head injury affected the brain was a mystery, for the worst injuries did not always produce dementia. The dements did not as a rule show any tendency towards recovery. Another small group developed progressive and fatal dementia shortly after a typical spontaneous subarachnoid hæmorrhage where there was no clinical

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evidence of hæmorrhage into the substance of the brain.

The CHAIRMAN spoke of the extreme rarity of tumours in the mental hospital service. The cerebellum, he observed, often escaped the attention of the pathologist, who might therefore be missing valuable evidence. He asked whether the vasculo-renal changes were observed in Alzheimer's and Pick's psychoses.

NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY

AT a meeting of this society held in Sheffield on March 18th, a paper on the

Radium Treatment of Carcinoma Vulvæ

was read by Dr. FRANK ELLIS, medical director of the Sheffield Radium Centre. Such treatment had been generally discredited in the past, he said, because of the high incidence of necrosis and local recurrences. But by modification of the usual technique so as to secure more uniform irradiation of the growth the outlook for radium therapy had been transformed and it could compete with surgical measures in the management of carcinoma vulvæ. The first and perhaps the most important modification had been an insistence upon nursing the patients in the same posture as was adopted for insertion of the radium. By this means the radium needles retained their proper spatial relationships throughout the treatment and undesirable crowding after return of the patient to bed had been avoided. Where the growth was at the anterior end of the vulva the needles should be inserted with the patient lying supine; where it involved the posterior end of the vulva the left lateral position should be adopted and the patient nursed in the same position; where the whole vulva was affected the needles should be inserted, and nursing carried out, with the patient in the lithotomy position.

When needles had to be placed on the surface of the growth, Sorbo rubber pads must be used to protect adjacent skin surfaces and to keep the needles at a known distance from the growth. After the needles had been inserted, a perforated rubber dressing should be placed over the vulva and eusol irrigation practised twice daily. An indwelling catheter was necessary. Dr. Ellis had found his results were best when all the needles were placed 1·5 cm. apart. The theoretically better distribution of the radium, with the periphery of the growth receiving half as much radiation again as the centre—i.e., placing the peripheral needles 1 cm. apart—had not given such good results. The total dosage ranged between 4500 and 7000 röntgen units. Where interstitial irradiation of the glands was necessary, two planes of radium must be employed when any glands had a diameter of more than 1 cm.; these planes should be 2 cm. apart. In the after-treatment important details were the avoidance of hot baths and ointments. For the desquamation stage gentian-violet was the best application. Moist desquamation should be treated with 0·5 per cent. silver nitrate solution. Necrosis and residual carcinoma called for excision.

The cases treated fell into five stages: Stage I, operable primary growths; Stage II, operable primary growths with mobile glands; Stage III, operable cases; Stage IV, recurrences after treatment; and Stage V, hopeless cases. In 1935 9 cases had been treated: 3 of these were Stage I growths and all 3 patients were still alive and free from disease; the other 6 had died. In 1936 14 cases were treated: 4 belonged to Stage I and were alive and free from recurrence; 2 out of 4 Stage II cases, the 1 Stage III case, and 1 of the Stage IV cases were alive. In discussing the choice between radium and surgery, Dr. Ellis pointed out that both methods had their successes and failures. Radium had advantages over surgery in the absence of shock and operative mortality, minimal damage to the urethra, and a wider application in advanced cases. Operation had the advantages of avoiding necrosis, possibly less subsequent discomfort, the removal of pre-cancerous tissues, and the possibility of removing affected iliac glands.

Dr. J. E. STACEY (Sheffield) referred to a paper he had previously read before the society condemning the use of radium in these cases in view of the seemingly inevitable radium necrosis which had always called for secondary excision of the vulva. Since the introduction of Dr. Ellis's technique his views had changed and he had no doubt that in certain cases radium therapy was now the method of election.

Parturition after Prolapse Operations

Mr. BRYAN WILLIAMS (Liverpool) read a paper on pregnancy and labour following operations for prolapse. His attention had been drawn to the problem by a case of severe and almost fatal dystocia due to cervical stenosis following an operation for prolapse. Since then he had seen 72 cases of pregnancy following such operations and in 62 of them full details could be obtained. A ventrofixation had been performed in 5, and no adverse effects were noted in subsequent pregnancies. Vaginal repair, with amputation of the cervix, had been done in 37 cases by fourteen different surgeons, and a total of 49 pregnancies had followed. These figures were too small to decide whether cervical amputation lowers fertility but it was clear that the operation is by no means a sterilising procedure as some authors had claimed. Of these 49 pregnancies, however, no less than 28 (68 per cent.) had ended in abortion or premature labour. Comparison of this figure with the results of pregnancies following vaginal repair in which the cervix had not been touched showed that the factor responsible for the premature termination of pregnancy was the amputation of the cervix. Perineorrhaphy alone had been performed in 12 cases, and of the 18 subsequent pregnancies 16 went to term.

Taking all the cases in the series in which the perineum had been repaired only 29 per cent. had a normal delivery without a fresh laceration.

Could anything be done to improve these results? In Mr. Williams's opinion the solution seemed to lie in the avoidance, so far as possible, of extensive cervical repairs in women of child-bearing age, and the more extensive use of episiotomy early in the second stage in cases where a previous plastic vaginal operation had been performed. Episiotomy must be done early to derive the maximum advantage and to ensure primary healing. Its use was imperative wherever a complete perineal tear had been previously repaired.

Complete discussion of the paper was deferred until the next meeting of the society when Dr. J. W. A. Hunter (Manchester) is to read a paper on the same subject.

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REVIEWS AND NOTICES OF BOOKS

The Practice of Urology

By LEON HERMAN, B.S., M.D., Professor of Urology, University of Pennsylvania, Graduate School of Medicine; Urologist to the Pennsylvania Hospital and to the Bryn Mawr Hospital. London: W. B. Saunders Company. 1938. Pp. 923. 45*s*.

THE general practitioner who has the capacity or leisure to read even a fraction of the literature that has been prepared for him is surely a mythical figure. The ordinary hard-worked man would be quite incapable of performing the feat that is expected of him by hopeful authors. Prof. Herman's book on urology, however, does supply, as few text-books do, just those facts about urology of which the medical adviser of a patient should be possessed. The chapter on prostatic obstruction, for instance, contains no description of the technique of prostatectomy, but a judicial survey of the advantages and disadvantages of the methods of treatment available: palliative measures, suprapubic and perineal prostatectomy, and per-urethral resection. The risks and complications of each operation are carefully tabulated, and statistics are furnished to give an idea of the mortality-rate attached to each procedure. Rare diseases, of interest mainly to the specialist, and all controversial matters are excluded from the text, but many conditions, such as neuralgia of the testicle, which are not generally mentioned in current text-books, are noticed instead. The important subject of male sterility, which in many works of this kind is dismissed in a few paragraphs, is well summarised, and the method of collecting a specimen of semen for analysis is described in sufficient detail to allow the practitioner to collaborate successfully with the expert.

Dr. Herman's work is thus exactly what he intends it to be—"A practical treatise of diseases of the urogenital system . . . for the use of general practitioners and surgeons." The subject matter is skilfully arranged, and the text is well illustrated.

Poison

By HUGO GLASER. Translated into English by MARGUERITE WOLFF. London: Hutchinson's Scientific and Technical Publications. 1937. Pp. 292. 8*s*. 6*d*.

THE subject of poisons is always fascinating and Herr Glaser's book is almost as exciting as a novel. It has obviously been intended primarily for the inquiring layman and the medical man must not expect detailed information on specific points. The author has, in fact, succeeded in maintaining our interest mainly by covering a very wide field. He deals, for example, not only with the usual chemical substances of toxicological interest, but also with poisonous animals, fungi, and bacteria. Incidentally he gives a full account of gas warfare, expressing the view that the Germans first used gas some months later than the Allies—although the evidence he brings forward for this is unconvincing.

It would be difficult to guess from internal evidence the profession of the author of this book. The publishers do not help us but Herr Glaser, it appears, wrote a book about "Ehrlich 606" when salvarsan was new. His account of the bacteriology of food poisoning is poor; no biochemist would say that the intermediate stages of alcoholic fermentation are "still Nature's secret," nor would a pharmacologist compare muscarine with belladonna poisoning. It seems likely that Herr Glaser's main interest is in forensic medicine since this book contains many accounts of trials in poisoning cases; the reader over-familiar with the stock examples quoted in English text-books will be relieved to find here in their stead accounts of cases of murder or mass poisoning in south-east Europe which have not before been published in any detail in this country.

The translation is somewhat clumsy in many places and words are not always given their usual meanings; thus "social hygiene" is used instead of "public health," and we are told that in Rome "the aqueducts were conducted through lead pipes." A more serious error is the confusion of potassium chloride and potassium chlorate. These are minor if irritating defects and the book can be recommended to those who wish to brush up their toxicology pleasantly.

Nelson New Loose-Leaf Medicine

Editor-in-chief: W. W. HERRICK, B.A., M.D., Professor of Clinical Medicine, College of Physicians and Surgeons, Columbia University, New York. London: Thomas Nelson and Sons. 1937. In 8 volumes and index volume. £29.

IN the editor's introduction to this system of medicine he states that its purpose is "to mirror present-day medicine." With a view to avoiding obsolescence, an imminent threat to success at a time of rapid development, the work is issued in loose-leaf form in order that addenda bringing the various articles up to date may be inserted from time to time. A long list of expert contributors and a distinguished editorial board, predominantly trans-atlantic, contain also representatives of this country and of France.

Though the date on this issue is 1937, the work first appeared in 1920. In its present form, after seventeen years, it gives, as might be expected, a rather patch-work impression, since some articles are retained unchanged from the first edition, some remain with addenda, and others are completely rewritten at various dates. In many of these older articles, such as those on typhoid and typhus fever, small-pox, and many of the sections on diseases of the liver and of the nervous system, an excellent account is given to which, in the absence of any recent advances on the purely clinical side, nothing need be added; but others show distinct evidence of their age and have not always been rejuvenated by appropriate addenda. In this category fall the sections on diagnosis and treatment of pulmonary tuberculosis, on influenza, on the general aspects of the cancer problem, on the hæmorrhagic diseases, and on abscess of the lung, all written apparently in 1920; on spontaneous pneumothorax, written before Kjeergaard's work was published; and on diseases of the bronchi and bronchoscopy, written before lipiodol bronchography was introduced. In some of the older sections the radiological illustrations seem very uninformative, judged by modern standards. For the absence of discussion of the rôle of the parathyroids from the article on diseases of the bones (apparently 1920) a complete account of it in a more recent section on the endocrines hardly compensates. In other places, such as the sections on the treatment of infections and on pneumococcal pneumonia, addenda have been successful in modernising the presentation; but in general where there have been

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recent developments only the rewritten articles really succeed in presenting a clear concept of current views.

Another factor which contributes to the general lack of homogeneity is the variation in the style and comprehensiveness of the articles. Some, especially among the older articles, are presented in orthodox text-book style, without references; some give a few key references, others an extensive bibliography. The relative amount of space devoted to a subject is sometimes quite out of proportion to its importance in practice. Thus, the excellent article on congenital heart disease is well documented and authoritative; but it should not have been allowed to occupy 114 pages out of approximately 500 devoted to the whole of cardiology.

The articles are not systematically dated; in a work of this nature it is imperative for the reader to know when the article he consults was written. Those who were original purchasers could make a note of the date on which they received each addendum, but new readers are sometimes compelled to estimate the dates, especially of the older articles, by internal evidence.

The eighth volume, labelled "Research—Current Literature," is designed to contain reviews and abstracts sent out from time to time. The volume received by us for review contained "surveys of current literature," issued monthly from April to November, 1932, which consisted of specially written reviews of several subjects. Thereafter followed a miscellaneous collection of direct abstracts, mostly of articles not advancing but of those expounding accepted practice. Perhaps the scheme for this volume proved to be too ambitious for fulfilment.

The volumes are well produced, the loose-leaf bindings being sturdy and convenient. The type, arranged in double columns, is easy to read; and the illustrations, both black-and-white and coloured, are well reproduced.

Anaglyphs

Their Use in Orthoptic Training. By MARGARET DOBSON, M.D. Lond. London: C. Tinling and Co. 1938. Pp. 41. 21*s*.

THE treatment by exercise of certain disturbances of binocular vision, either with the idea of primary cure (particularly in heterophoria) or with the object of assisting operative procedure beyond its purely cosmetic end, has long been accepted as a rational procedure and is undoubtedly successful in certain cases. Miss Margaret Dobson puts forward the suggestion that selected anaglyphs can with advantage be employed in orthoptic training. For those to whom the term is unfamiliar it may be explained that an anaglyph is a superimposed stereogram. In its construction each picture of a stereoscopic pair is coloured, one in red and one in complementary green, and both are printed, overlapping to an extent determined by optical principles, on a white background as a single picture. An anaglyph seen by the naked eye is very confusing, but when red and green screens are placed before the eyes, the picture is seen as a single monochrome in which the depth of the various parts is very clearly perceived. Miss Dobson rightly maintains that the full appreciation of depth is a factor of great value in making a patient ocularly submissive to such movements of the muscle system as happen in the course of correctional exercises, and she finds anaglyphs of great help in achieving it.

She devotes a few pages to a clearly worded enunciation of some of the principles of physiological optics. It is satisfactory to read (p. 27) that "it is not necessary to take any special notice of all muscle imbalances, because the correction of the refractive error, provided the visual acuity in each eye is equal, will frequently produce orthophoria." The suggestion (p. 34) that training in stereoscopic vision is of inestimable value to motorists and air pilots may give a wrong impression; actually stereoscopic vision, though very useful, is by no means essential for the successful piloting of aircraft. There is a pocket at the back of the book which holds two "training anaglyphs." While we agree that exophoria could be treated as described in the training anaglyph No. 2 (the "V" anaglyph), it seems to us likely that esophoric states might be better attacked by reversing the red-green filter that is held before the eyes. In the card supplied with the "V" anaglyph the numbering of the exercises is not quite clear; Nos. 1 and 2 seem to be absent. The system described in this book certainly has a place in the routine treatment of such ocular muscle imbalances as fall within its scope.

England Before and After Wesley

By J. WESLEY BREADY, Ph.D. London: Hodder and Stoughton. 1938. Pp. 463. 10*s*. 6*d*.

No direct connexion between medical progress and the evangelical movement of the eighteenth century is generally recognised. Dr. Bready's thesis is that every item of social reform which has been slowly evolved since the middle of that century had its source and motive power in the writings and teachings of John Wesley and his followers. Among his many activities Wesley was an ardent advocate of improved social conditions for the masses of the people, and in 1746 "founded the first really free dispensary in England." He also essayed to give the people means of simple and common-sense treatment of their ailments and to that end compiled a book entitled "Primitive Physic (An Easy and Natural Method of Curing Most Diseases)." This volume, though containing much that is ridiculous in the light of modern knowledge, did teach the true principles of household and personal cleanliness and thus helped to lay the foundation of the great sanitary service in which England was later to lead the world.

The author of this book is clearly a well-read and accomplished historian, and it is thus regrettable that he has drawn his black and white with too hard a line. England was surely not such an unmitigated sink of iniquity as he depicts in his first part of his book. "Ten righteous" wrote Cowper of London at this period, "would have saved a city once; And thou hast many righteous: well for thee That salt preserves thee." Dr. Bready's outlook is deliberately biased by his own firm convictions and he does not pretend to present a balanced survey of influences other than the religious revival that may have contributed to social progress. His style is emphatic rather than persuasive: the wealth of abusive adjectives hurled at everything of which he disapproves leaves him with no adequate resources when he really requires damnatory expressions.

Whether or not one accepts Dr. Bready's view of the debt medicine owes to Wesley, the claim that he puts forward for the paramount influence of the great Revival on social reform deserves attention. The religious movement has probably received less credit for the astonishing material progress between 1750 and 1850 than it deserves, and the student of medical history will in this provocative book approach his subject from a new angle. Like all other readers he will be charmed by the quality of the plates that illustrate it.

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THE LANCET

LONDON: SATURDAY, MAY 21, 1938

THE PATHOLOGY OF AURAL VERTIGO

THE disturbance of the labyrinth which causes vertigo may be brought about by a great variety of conditions, from wax impacted in the meatus to acute labyrinthitis. If we except the latter, in which it is continuous until the labyrinth has been destroyed, the vertigo is generally intermittent. It is usually associated with deafness of, or preponderatingly in, one ear, which may be either of the nerve or of the middle-ear type. The attacks vary much in frequency, and in severity from a mild transient giddiness to such an intense vertigo that the patient is not only unable to stand but clutches the bed for fear of being thrown out. When vertigo accompanies middle-ear disease, treatment of the latter condition often effects a cure or great improvement, and dramatic results sometimes follow catheterisation of the Eustachian tube. But, since frequent and severe attacks incapacitate the sufferer from work, drastic measures are justifiable in intractable cases. Alcohol may be used to destroy the labyrinth, injected either into the external semicircular canal, as suggested by W. M. MOLLISON,[1] or through the fenestra ovalis as advised by A. J. WRIGHT,[2] who described his technique at the discussion reported on another page, and by J. R. PEACOCK.[3] An alternative procedure is division of the auditory nerve, or of its vestibular portion, within the skull; this operation is naturally not free from danger. Two patients who succumbed after division of the nerve with symptoms of increased intracranial pressure have provided Prof. HUGH CAIRNS and Mr. C. S. HALLPIKE with an opportunity to study in detail the pathology of the condition.

The fact that the exact mechanism by which vertigo is produced is obscure, and our lack of knowledge of the actual morbid changes within the labyrinth in these cases gives importance to their communication; indeed their elaborate investigation of the anatomical changes in the temporal bone was hailed by their colleagues as unique. The histological preparations showed gross dilatation of the endolymph system, degeneration of Corti's organ and the stria vascularis, and pathological elevation of the otolithic membrane of the utricle; in both cases there was a symmetrical chronic inflammatory condition of the mucosa of the middle ear. Mr. HALLPIKE found that, in these two cases, the perisaccular connective tissue was very poorly developed, and suggested that the dilatation had been brought about, at any rate in part, by some disorder in the mechanism of fluid absorption through the saccus endolymphaticus. But, as this tissue had been found absent in two of thirteen normal cases, its absence can be no more than a predisposing anatomical variation; the primary factor might be either a hypersecretion of the endolymph or some unknown alteration in its chemico-physical constitution. It may be that such a primary factor is common in disease of the ear, but only causes vertigo when fluid absorption is diminished by the predisposing anatomical variation. Mr. HALLPIKE advanced an interesting speculation to explain the typical intermittent character of the vertigo.

It is not surprising that such investigations are rare when one considers the extreme difficulty of accurate examination of the delicate structures of the labyrinth encased in dense bone. This is not, however, the only direction from which the problem can be approached. If the relief of this condition can be obtained by operation with a reasonable degree of safety as CROWE contends [4] on the basis of nearly 100 successful cases, the choice between section of the whole auditory nerve and of the vestibular portion must depend on most careful study of the symptoms and the hearing in either ear of each patient. Prof. CAIRNS pleads for a re-examination of the clinical picture of aural vertigo, and as one of the first essentials, a collection of reliable data on vertigo due to various disturbances in the external and middle ear, confirmed by continuous observation over a period of years. Only from a combination of histological, physiological, and clinical studies can progress come.

OUGHT SUICIDE TO BE A CRIME?

A CORRESPONDENT, writing to the *Times* last week, made a strong case for deleting suicide and attempted suicide from the criminal code. "They belong," he declared, "to the doctors." His letter was called forth by the recent decision of the House of Lords in Beresford *v.* Royal Insurance Co. The facts will be familiar from the previous stages of the litigation. Major Rowlandson held life insurance policies for £50,000. His affairs were so hopelessly involved that he could not keep up the payment of his premiums. He was allowed an extension of time until 3 o'clock on a certain afternoon in August, 1934. At a few minutes before 3 o'clock he deliberately shot himself in a taxi-cab. His sister, Mrs. Beresford, claimed the insurance money as his administratrix.

The company refused to pay. Suicide is a crime. Sir John Jervis, in the first edition of his book on the office and duties of coroners, observed that self-murder was "wisely and religiously considered by the English law as the most heinous description of felonious homicide." A man cannot commit a crime and make a profit out of it. He cannot

[1] Mollison, W. M., *J. Laryng.* 1936, 51, 38.
[2] Wright, A. J., *Ibid*, 1938, 53, 97.
[3] Peacock, J. R., *Lancet*, Feb. 19th, p. 421.
[4] *Medicine*, February, 1938, p. 1.

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insure his house, set fire to the premises, and claim the money. Public policy forbids. Major Rowlandson's contract of insurance contained a clause that it should become void if he committed suicide, whether sane or insane, within the first twelve months. Lord Atkin holds that the clause meant that the company would pay if Major Rowlandson deliberately committed suicide after the twelve months were over. If, however, this is what the company undertook to do, the House of Lords has now decided that the company cannot do it. Neither the assured nor his estate may profit by his crime. The decision, irreproachable as it may be on legal grounds, is causing disquiet among laymen. The company, they say, was willing to pay; it calculated its rates of premium with knowledge of the risk; it accepted Major Rowlandson's premiums and it ought to carry out its own side of the agreement. A man insures his life for the sake of his dependents. They get no benefit till he dies. They need to be provided for whatever the cause of death. Why should they suffer if he has been so hardly driven by circumstance that he makes an end of himself? The simplest way to avoid the unfortunate effects of the decision in the Beresford case is to enact that suicide and attempted suicide shall cease to be a crime. The law has been tending towards this greater leniency for many generations. Anciently if a coroner's jury found a verdict of felo-de-se, the goods of the deceased were forfeited to the Crown and the corpse was, under warrant from the coroner, buried at midnight in a highway (usually at the cross-roads) with a stake thrust through it and without Christian rites. The barbarous method of burial was altered in 1823 and again in 1882. The forfeiture of goods was abolished in 1870. More significant still, the annual volumes of criminal statistics have officially stated that it is no longer the practice of the police to institute a prosecution for attempted suicide unless this course is made desirable to ensure that the defendant can be adequately looked after for the future.

The sole question, in other words, is the physical and mental welfare of the unfortunate creature for whom circumstances have proved too much. Major Rowlandson has furnished what a jury has found to be an unmistakable instance of a man committing suicide while in full possession of his senses. Mr. H. R. Fedden[1] has recently expressed the view, in a study of suicide throughout the ages, that deliberate self-slaughter is more common than is generally admitted. The public, nevertheless, is likely to remain convinced that nobody who commits or attempts to commit suicide is entirely normal. One by one the vestigial survivals in our legal system are being eliminated by a policy of progress and reform. Suicide has evidently lost its old significance. Are we ready to be realists—to tear another tattered page out of the criminal code and "leave suicide to the doctors"?

[1] Suicide. By Henry Romilly Fedden. London: Peter Davies. 1938. Pp. 351. 12s. 6d.

DIABETES AND THE ANTERIOR PITUITARY

SINCE the time of VON MERING and MINKOWSKI there has been little doubt that the pancreas is intimately concerned in carbohydrate metabolism. The isolation of insulin from the pancreas by BANTING and BEST, and the successful treatment of diabetes with this hormone, apparently provided proof that the cause of diabetes mellitus lies in deficient secretion of insulin by the islets of Langerhans. But in medicine, as in other subjects, things are seldom what they seem, and the experiments of the last eight years, initiated by HOUSSAY in the Argentine, have shown that the anterior lobe of the pituitary gland plays an important, if not dominant, part in controlling the metabolism of carbohydrate. Two facts of great importance emerge from these experiments: the first is that removal of the pituitary gland diminishes the severity of the diabetes that ordinarily follows extirpation of the pancreas; the second is that daily administration of an anterior-pituitary extract to normal animals may produce a condition resembling diabetes. This diabetic condition may become permanent after quite a short period of treatment with anterior-pituitary extract.

It is generally accepted that insulin can stimulate the oxidation of carbohydrate in the body, and repress the formation of sugar from non-carbohydrate sources. Evidence is now accumulating that secretions of the anterior lobe catalyse the reverse processes—i.e., they inhibit the oxidation of carbohydrate and stimulate the formation of sugar from protein and possibly from other non-carbohydrate sources. These observations are the basis of the conception that the production and oxidation of sugar are regulated by the balanced, mutually antagonistic, actions of the internal secretions of the pancreas and of the anterior lobe of the pituitary. According to this theory diabetes results from faulty regulation of the relative intensities of the pancreatic and the pituitary factors, and may be caused by excessive pituitary action just as well as by deficiency of insulin secretion. The precise way in which the pituitary directly influences carbohydrate metabolism is not easily explained, and those who seek an account of recent investigations will do well to study the review presented a fortnight ago to the Royal Society of Medicine by Mr. F. G. YOUNG, Ph.D., of the National Institute of Medical Research. It may be noted here however that anterior-lobe preparations can now be obtained which abolish the hypoglycæmic action of insulin without raising the blood-sugar level, which induce the accumulation in the liver of abnormal amounts of glycogen and fat, and which give rise to ketosis in normal animals.

If one function of the anterior pituitary is to stimulate those processes which, pushed to excess, lead to diabetes, then one would expect to find signs of pituitary hyperfunction in some cases of diabetes mellitus. This expectation is realised: the association of diabetes and acromegaly has long been recognised, and substances with a

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physiological action resembling that of anterior-pituitary preparations have been detected in the blood of a particular, but not uncommon, type of diabetic patient.[1] It is therefore permissible to suppose that diabetes sometimes results from simple hypersecretion of certain elements of the anterior pituitary lobe. In such cases the pancreatic secretion of insulin may be normal, yet the symptoms may in general be indistinguishable from those due to a deficiency of insulin, and will be controllable by injection of extra insulin.

The diabetic condition that comes from giving anterior-pituitary extracts to animals may be either temporary or permanent. The temporary type, produced by daily administration of relatively small amounts of extract, disappears on the cessation of treatment, whereas the permanent type, produced by regularly increasing doses, continues indefinitely after the injections are stopped. In our last issue Mr. K. C. RICHARDSON and Dr. YOUNG described the changes observed in the islets of Langerhans of dogs exhibiting these two types of experimental diabetes. They pointed out that the pancreas of dogs with the temporary type of diabetes showed little abnormality beyond some cellular proliferation, and hydropic degeneration in individual islet cells. On the other hand the pancreatic islets of two animals with the permanent type of experimental diabetes showed extensive changes: in one these consisted in complete replacement of islet tissue by hyaline material, while in the other most of the pancreatic islets showed more or less depletion of the cytoplasmic granules of the beta cells. If, as seems possible, these islet changes account for the maintenance of the diabetic condition after cessation of pituitary injections, then clinically it may be found that a diabetes of pituitary origin, when allowed to progress untreated, is liable to turn into a pancreatic diabetes that will persist even though pituitary function returns to normal.

"A. E. B."

BOYCOTT'S place will be impossible to fill. An Oxford man to the core, it is doubtful whether he was spiritually anywhere completely at home except at Oxford, but fate ordained that he should carry the torch to other places. His services to academic pathology in this country can hardly be overestimated, for on every occasion he fought the battle of knowledge for its own sake and for him there could be no compromise between god and mammon. He was a brilliant and clear-minded expounder of difficult matters and his contributions to scientific discussion always aroused the admiration of his colleagues. It was to be regretted that he never wrote a text-book on general pathology, for no other British pathologist had his wide sweep and elegant utterance. Though so exceptionally a fine lecturer he was not of the type to form a school; to undergraduate students indeed he sometimes seemed somewhat aloof and olympian. His teaching never pandered to the baser side of the examination system, but he was exacting with his students and the schools over which he presided were always successful even by the standard of examination results. He had the rare and authentic literary gift of being able to infuse his personality even into the shortest letter or paragraph. He was perhaps to be seen at his best presiding with old-fashioned hospitality at the tea-table in the Graham library. Here plain living and high thinking were the order of the day. There was no butter to the bread but there was always spice to the conversation. Visitors of the most diverse interests would drop in. They were usually experts in something or other, for BOYCOTT had a flair for knowing experts of all kinds. In conversation he was as good a listener as a talker and this was no doubt what made him so delightful a companion to man, woman, or child. If he was an individualist, his individualism was of the kind to express itself in society rather than in solitude. He loved conversation and the fellowship of alert minds, and though an omnivorous reader he preferred, as he used to say, to hear things "by word of mouth." He was a prodigious attender of scientific meetings and he seemed to know in advance of every new thing in the world of biology. All ranks of British pathologists will miss his outstanding influence, but his intimates will have the added feeling that the world is permanently a little more drab for the loss of so vivid and kindly a personality.

A MEDICAL MINISTER OF HEALTH

THE Cabinet reshuffle has brought a medical man to the Ministry of Health for the first time since Dr. Addison's appointment when the Ministry came into existence twenty years ago. Mr. Walter Elliot served two periods as parliamentary under-secretary for health for Scotland before he became Minister of Agriculture. He pointed out himself on a recent festive occasion that the government of England was carried out by amateurs; one seldom found a distinguished general as Secretary of State for War, seldom too a distinguished doctor as Minister of Health. He then foresaw a time when he might find himself again listening for the tinkle of the night-bell; and there will undoubtedly be a feeling of satisfaction in the medical profession that, instead, he has accepted that high office for which his early training makes him peculiarly well fitted. It is good that from time to time the Minister of Health should be one who can look at health not only from the outside in terms of administration but from the inside in terms of human well-being. Dr. Addison's all-too-short career as the first Minister of Health was occupied with the amalgamation and rearrangement of scattered duties previously discharged by six or seven separate bureaux. Now the organisation is working so smoothly that a medical Minister may have leisure to think somewhat in terms of medicine. One signal opportunity is before Mr. Elliot: he knows as well as any living person where the nation's milk-supply comes from and how its quantity might be increased, and if he can also ensure its safety as a food he will do a great service. The marriage of health and agriculture has been advocated as a means of improving the state of mankind, and in Mr. Elliot the two Ministries, if not the two interests, find a hopeful union.

[1] de Wesselow, O. L. V., and Griffiths, W. J., *Lancet*, 1936, 1, 991.

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ANNOTATIONS

BLOOD-SUPPLY OF THE FAILING HEART

DATA from experiments on the flow of blood through the heart arteries of animals have only a limited application to human physiology and pathology, and observations on coronary flow through revived human hearts are more likely to help in clearing up questions that have given rise to controversy. In the last few years several workers have found it possible to revive the heart in man for a few hours after death, even when it was diseased, and an investigation of coronary flow in the hearts of 15 patients who died of chronic heart failure is reported by Kountz and Smith.[1] For such experiments a heart-lung preparation is the ideal; but owing to pulmonary œdema and other complications this could be made in only 2 instances, and for the others the isolated perfused heart was used. In these hearts that had failed the absolute coronary flow was found to be much the same as in normal hearts, but the flow per gramme of muscle per minute was always reduced. In the normal heart an increase in the perfusion pressure increased the flow, whereas in the hypertrophied heart it did not do so. The effect of variations in diastolic volume, and of certain drugs which alter this volume, was also in many ways interesting. It has been established both for the human and the dog's heart that the coronary flow is greater during diastole than during systole, but this apparently does not apply when the heart is dilated. Kountz and Smith find that dilatation causes a shift in the time-relations of the flow, which is now greatest during systole. They also find that drugs that reduce dilatation—of which digitalis is the most important—increase the flow, the perfusion pressure being maintained constant. In the normal undilated heart, on the other hand, digitalis reduces coronary flow. Adrenaline and the nitrites had the reverse effect—namely, a decrease of flow in the presence of dilatation, but an increase in the undilated heart. The difficulties in getting the material and also in the technique of such experiments as these must be considerable, but their results have big advantages over those of animal experiment. The work of Kountz and Smith suggests that both hypertrophy and dilatation reduce the blood-supply to the heart (relatively to its size), and it provides additional evidence that the action of a drug on the heart differs according to the functional state of the organ. An important application of this knowledge is to treatment with digitalis: when digitalis is given in the absence of the proper indications not only will it fail to do good, but it will probably do harm.

THE POSSIBILITIES OF "NEUTRON THERAPY"

THE neutron, discovered by Chadwick and of special interest because it carries no electric charge, can now be obtained in a beam available for direct use as a possible future form of radiotherapy. An apparatus called the cyclotron for the production of this beam is described in the *Journal of the Canadian Medical Association* for March, 1938, by Prof. J. Stuart Foster of McGill University. The cyclotron which is comparatively simple in design depends in principle on the fact that given certain conditions the ions circulating in a magnetic field can be rapidly accelerated so that they finally strike a target with an energy of five and a half million volts. The fact that it is simple in design does not mean that the cyclotron is easy to construct or operate. The bottom section of the electromagnet weighs 85 tons, and the intensity of the primary cyclotron beam is enormously greater than that from any other known source of radio-activity. The beam has two possible therapeutic applications—for the direct radiation of patients and for the production of new nuclear forms such as radio-sodium. This has a half value period of 14·8 hours, and finally loses all radio-activity and passes to a magnesium nucleus of mass 24. The magnesium nucleus is formed in an "excited" state, but becomes normal immediately with gamma ray emission, ordinary sodium being thus turned into ordinary magnesium as a result of activation by the cyclotron beam. Trial of the neutron beam for the actual treatment of malignant disease may be expected. E. and J. Lawrence at Berkeley are already carrying out biological experiments with tumour implants in mice and other subjects. The use of radio-sodium to make "bombs" is suggested by Prof. Stuart Foster, and since radon has been used in this form for many years in certain American clinics, the idea does not seem to be beyond practical possibilities. The biological effects of neutron beams are already being studied in this country in the hope of extending the scope of radiation therapy.

OCCUPATION AND MORTALITY

THE Decennial Supplement of the Registrar-General of England and Wales relating to the occupational mortality experience of the years 1930–32 is now in the printer's hands, and as at present we have no statistics in this field later than those of 1921–23 it will be awaited with considerable interest (and some impatience). A foretaste of what is to come was contained in an interesting paper read by Dr. Percy Stocks, medical officer to the General Register Office, before the Royal Statistical Society on May 17th. The main problem with which he dealt was the difficulty of separating the direct effects of a man's daily work from the accompanying indirect effects of the environment in which he has to live in order to carry out that work. Certain industries are largely localised and therefore geographical influences may well contribute to their mortality experience; in addition different occupations lead to different standards of living, housing, and nutrition, which will have a like effect. In the wide sense such standards of life may, of course, be regarded as necessary, or unnecessary, adjuncts of the occupation and therefore components of its mortality; but in the narrower sense of risks inherent in the work itself their presence is likely to obscure the issue. To measure the direct effect of occupation upon male mortality, apart from these correlated factors, it has been suggested that the mortality of married women should be tabulated according to the husband's occupation, and this is being carried out in the 1930–32 report. The experience of the wives gives a measure of the general mortality background of a group and thus the difference between them and their husbands a measure of the extra, or smaller, risk to the latter. Analysis of social class mortality in this way leads Dr. Stocks to conclude that the contribution made by the actual work done to the men's social mortality gradient (from all causes of death) is very small compared with the contribution made by the accompanying environmental, economic, or selective factors. The standardised mortality

[1] Kountz, W. B., and Smith, J. R. *J. clin. Invest.* March, 1938, p. 147.

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ratios of males at ages 20–65 range in 1930–32 from 90 for social class I to 111 for class V, but those for females by class of husband from 81 to 113. Division by cause of death shows that cancer mortality as a whole has a much slighter social gradient for married women than for men, while diabetes falls rapidly from classes I–II to class V amongst males but tends to go in the opposite direction for females, a result of considerable interest. Accidental causes, as might be expected, are more affected by social grading amongst the men than amongst the wives, but hernia shows a greater class differentiation amongst the women and angina pectoris, appendicitis, and gall-bladder diseases a steeper gradient in the men. Thus it seems, as Dr. Stocks points out, that social affluence is more dangerous to men than to their wives because it tends to bring in its train enhanced mortality from diabetes, apoplexy, nephritis, and gall-stones, and to increase their mortality from angina pectoris, appendicitis, cirrhosis of the liver, and suicide to a greater degree than is the case amongst their wives. Specific occupations give equally interesting results. For instance farming confers, through its localisation in the country, some measure of survival advantage upon farmers' wives; but the farmers themselves enjoy an even greater relative advantage, suggesting that the work they do is in itself beneficial. On the other hand inn- and hotel-keepers involve their wives, through selection, environment, opportunity, example, or participation in the husband's occupation, in an excess mortality amounting to about a third of the excess suffered by such men themselves. Such methods of analysis are, it is clear, likely to increase, perhaps substantially, our knowledge of occupational advantages or disadvantages, and Dr. Stocks gives more than enough to whet the appetite.

HUMIDITY IN THE BRITISH ISLES

HUMIDITY is no doubt an important factor in the effect of climate on health, and probably plays a large part in making a particular climate what is known as bracing or relaxing. A discussion three years ago at the Royal Meteorological Society left an impression however that it was not very clear to anybody what these terms really meant. Exact data have hitherto not been readily accessible, but the publication by the Meteorological Office of a handy brochure giving averages of humidity for the British Isles (M.O. 421, H.M. Stationery Office, 9*d*.) will now enable those who are interested to ascertain the average humidity of the air in any month over 44 stations in England, Scotland, and Ireland. The averages are based on at least 15 years' observations made at 7 A.M., 1 P.M., and 6 P.M., and for the mid-day reading both relative humidity (percentage of saturation) and vapour pressure (a measure of the actual amount of water in the air) are given. Charts have been constructed showing graphically the distribution of humidity, from which it would appear that the amount of water vapour in the air over these isles steadily increases from January to July or August and then decreases until the end of the year. On the other hand the relative humidity decreases with the rising temperature during the same period to a minimum in July. A small area north of the Thames seems to be the least humid part of the country, and it is curious that Kew, which is on the Thames, should be the only station showing an average relative humidity of less than 60 per cent. for three months in the year. That rainfall depends little on absolute and much on relative humidity is shown by a comparison of Kew and Stornoway, which have much the same absolute humidity throughout the year while the relative humidity is 67 at Kew and 81 at Stornoway, which has double the rainfall of Kew.

A MUNICIPAL ASTHMA CLINIC

ALTHOUGH clinics devoted exclusively to bronchial asthma are by no means new, yet for a local authority to start one is something of a novelty. A recent venture along these lines is the municipal asthma clinic at Cardiff, the scope of which was outlined by Dr. D. A. Williams at a sessional meeting of the Royal Sanitary Institute on May 6th. An offspring of the Llandough Hospital, this clinic was started in 1935 at the City Lodge Hospital, Cardiff, with the object of extending the work that had already been begun in the specially prepared side wards of the hospital. Such a clinic was considered desirable for several reasons. (1) The seasonal incidence of the disease and the diversity of substances to which a sufferer might possibly be sensitive require individual observation for long periods. (2) Treatment, including desensitisation, vaccines, and breathing exercises, must frequently be lengthy if success is to be achieved. (3) It is more likely to attract the early cases at a stage before permanent damage to the lung and chest wall has resulted, the outlook being much better if treatment is started before the age of 10 years. Cardiff residents are asked to pay 1*s*. per visit if they can afford it; if, however, their circumstances are too straitened they pay less, while some who are unemployed are seen free of charge. The clinic is at the service of those living outside the town for a fee of 5*s*. That the clinic has found favour in the eyes of the school medical officers, the general practitioners, and the public is evident from a study of the attendance figures. During the three-year period 1935–37 the number of new patients who attend annually has been trebled while the total number of visits paid to the clinic has shown a seven-fold increase. In 1937 352 new cases were received and 6085 attendances made during the year.

ALTERING THE SEX RATIO

THAT we are still very much in the experimental stage in our efforts to control the sex ratio of offspring is evident from a review[1] by Mr. Arthur Walton, Ph.D., of the Cambridge school of agriculture. He reminds us that the mammalian male produces sperms of two sorts—*x* and *y*, female- and male-determining respectively—whereas the female produces only one sort of egg. Three possible methods of controlling sex by influencing the gametes are discussed. The first, parthenogenesis, is dismissed as impracticable at present for mammals. The second, sex reversal (e.g., by injecting sex hormone into the yolk-sac after the embryo has started developing in one direction or another), has recently been attempted with some success in certain mammals, but is still obviously impossible for man. The third is the separation or differential destruction of the *x* and *y* sperms, and this is at present certainly the most feasible; but as Dr. Walton says, much of the work done on it has to be discounted because the investigators have not given due consideration to the statistical significance of their data. He mentions attempts at effecting gametic separation by cataphoresis, by altering the reaction of the vagina, by subjecting sperms to an electric field of high-frequency

[1] *Sci. Progr. Twent. Cent.* April, 1938, p. 694.

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current, and by storing them for increasing periods before using them for insemination. Although the results of most of these human and animal experiments have been negative or doubtful—and in particular he dismisses the acid and alkaline theory as non-proven—Dr. Walton thinks there is evidence that, under certain conditions, as yet unspecified, it may become possible to segregate the two types of spermatozoa by means of differential mortality and so achieve a measure of sex control.

SPONTANEOUS HYPERVENTILATION TETANY

HYPERVENTILATION tetany is one of an interesting group of conditions induced experimentally in man some time before it was detected in medical practice. It is now a well-recognised syndrome and the clinical records of the last eight years show that it is much commoner than was at first supposed and that it may be induced by very little over-breathing. Seen chiefly among women of the neurotic hysterical type, the attacks are readily precipitated. Harwood,[1] who reviews the history of the disease, adds three cases of his own, all of which were fairly typical except that one of the patients was a man and all of them responded satisfactorily to treatment. The treatment consisted in demonstrating practically to the patients the cause of their attacks so that they could voluntarily avoid them; but unfortunately this measure is by no means always successful. Some hysterical women are quite unable to control their breathing although they know very well that an attack of tetany is imminent and that it will cause them pain and subsequent discomfort. Psychotherapy seems to be the only hope for these sufferers. So far no cases have been recorded in which the period of apnœa following hyperventilation has been prolonged enough to produce anoxæmia and unconsciousness, as it did in McCance's experiment on himself[2]; but sooner or later such an accident will no doubt be encountered.

THE ANAEROBIC BACTERIA

THE group of bacteria characterised by growth in reduced oxygen tension has peculiar interest; it contains some of the most chemically active organisms whose power to ferment various substances is astonishingly well developed. From the point of view of human disease its most important members are the organisms responsible for the gas gangrene infections of wounds and the bacillus secreting the tetanus toxin. An encyclopædic treatise[3] dealing with the anaerobic bacteria has recently been completed by Dr. M. Weinberg and his collaborators at the Pasteur Institute. Dr. Weinberg has made a life's study of these organisms, has made contributions over more than 20 years to the now vast literature on the subject, and is the senior author of two previous treatises. In this new work an attempt has been made not only to include all the known anaerobic species but to record first-hand observations upon a considerable proportion of them. Not that it has been possible to elaborate a sound classification for the group as a whole. Indeed the collection together of organisms merely on the score of their anaerobic growth even where reduced oxygen tension is an obligatory condition of proliferation can hardly be defended on systematic grounds. But there is some convenience in having under one cover descriptions of all the various kinds of anaerobes—the spore-bearing Gram-positive, the Gram-negative, and anaerobic cocci, and the forms valuable in agriculture and industry, such as the cellulose fermenters and those which attack the glucosides and pectins. Actually the authors have tried to include too much; the long list of organisms stigmatised as "insufficiently described" might have been considerably enlarged by the transfer to it of some others to which undue prominence is given, and the list, once made, could have been safely omitted from further consideration. Among the better-known types we have noticed no important omissions nor has any aspect of their study been neglected—cultivation, biochemical reactions, serology, incidence, pathology, and so on are all discussed with full reference to original sources. The excellent table of contents and the alphabetical list of the organisms dealt with do not compensate for the lack of an index. The work will be useful to bacteriologists and pathologists, human and veterinary; the days when the anaerobes were neglected in clinical pathology are over but the difficulty of finding detailed information about this group or of the proper technique to use has still an inhibitory effect on their study.

[1] Harwood, R., *New Engl. J. Med.* 1938, 218, 600.
[2] McCance, R. A., *Lancet*, 1935, 2, 370.
[3] Les microbes anaérobies. By M. Weinberg, R. Nativelle, and A. Prévot. Paris: Masson et Cie. 1937. Pp. 1186. Frs. 250.

DAY NURSERIES IN THE PARKS

DURING the last three summers the National Society of Day Nurseries has been permitted to look after very young children in a marquee on a site in Battersea Park. The London County Council is reported to be now about to ask for Parliamentary powers authorising the Council and the metropolitan borough councils to allot small sites for this purpose in the London parks and open spaces. The annual L.C.C. (General Powers) Acts contain many clauses in advance of the law applicable throughout the country. In London, Manchester, and elsewhere legislative experiments receive local trial. Some municipality, for example, obtains statutory power to close certain streets at certain hours so that children may use the highway as a playground without the risks of traffic casualties. The experiment succeeds and a Street Playgrounds Act for the whole country then becomes possible. So, it may be hoped, with day nurseries in parks. If the Parks Regulation Acts do not permit these developments, or if the restraining hand of the district auditor is an obstacle, Parliament may well wish to authorise and encourage the experiment.

"PSEUDO-URÆMIA" IN PROSTATIC OBSTRUCTION

OBSERVATIONS that may well turn out to be of importance to urological surgeons and to their patients have lately been published by Prof. Abrahamsen and Dr. Aalkjær[1] of Copenhagen. Having made it a routine to determine the plasma bicarbonate and chloride concentrations in all their cases of enlarged prostate, they have discovered that many of the patients have (on admission) very low bicarbonate values in their plasma and are suffering from an acidosis which may be severe enough to interfere with the recovery of their kidney function under the usual treatment of drainage, fluids, and intravenous saline. They have been treating such patients with intravenous sodium bicarbonate solutions in calculated quantities and claim that the pre-operative treatment may be greatly shortened

[1] Abrahamsen, H., and Aalkjær, V., *Ugeskr. Laeg.* March 10th, 1938, p. 245.

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thereby. They say, moreover, that blood-ureas which remained high in spite of the accepted treatments fell rapidly to normal when bicarbonate was given. In the report now published Abrahamsen and Aalkjær only give partial records of two cases, and it is to be hoped that they will be able to record their data in much greater detail in the near future and that they will find space also to give their controls. It is interesting in this connexion to recall the beneficial effects of alkalis on children suffering from renal rickets and its attendant acidosis.[2] The effects of uncompensated alkalosis on the kidney are well known and it is possible that, although the kidney is an organ designed amongst other things to regulate the body's reaction, it is itself susceptible to changes in reaction in either direction and only works efficiently over a limited range of hydrogen-ion concentrations.

THE HOSPITAL YEAR

IN his annual review prefacing the Hospitals Year-Book, of which a new edition [3] has just appeared, Mr. Orde tells us that the number of beds in the voluntary hospitals of Great Britain and Ireland increased by 2772 during the year 1936 to a total of 90,835. There was a surplus of nearly half a million pounds of income over expenditure during the year, but this was swallowed up as usual in meeting capital expenditure on extensions. Mr. Orde asks and leaves open two questions: whether the voluntary hospitals spend their resources as wisely as they might, whether they could get better value for them or not. He then turns to consider how certain beliefs, still held strongly by many, concerning voluntary hospitals have arisen and whether they are really sound. The title "Supported by Voluntary Contributions" is still to be seen over the entrance of many hospitals; in Mr. Orde's opinion this obscures the picture, for the really important "voluntary" characteristics are not the sources of income but the absence of statutory control and of the desire to make profit out of the treatment of the sick. In no sense whatever, he says, is an honorary staff an essential feature of a voluntary system; and the failure to appreciate this fact has prevented those adjustments that progress forces upon voluntary hospitals as upon other human activities. He is scornful of the catchword that any approach to the State means death to the voluntary system. Were a vote taken to-day the majority of hospitals, he believes, would acknowledge that partnership with the State is desirable and that such a partnership would include finance; what a pity that this was not realised years ago when the State was obliged to make provision for complaints which made little appeal to voluntary effort or were in themselves a danger to the community. He has hopes that the stimulus of the Sankey Commission may still be in time to ensure the adequate control of hospital finance by some method as independent of politics as is the judicature.

The Year-Book itself is improving from year to year and gradually living down its rather clumsy format. Particularly significant is the growth of the directory of municipal and public assistance hospitals. Reaching us at the same time is an admirable brochure from the London County Council (No. 3342, 2*d*.) giving particulars of the hospitals provided by the Council, the methods of admission, and a brief outline of the facilities which the service affords. A more complete handbook (price 1*s*. 6*d*.) is available, but the short one is intended as a means of ready reference for practitioners desiring to obtain the admission of a patient to one of the Council's hospitals.

THE BILLINGS CENTENARY

OF the many illustrious names associated with the Johns Hopkins medical school Billings is probably the one which would least readily come to mind when reflecting on the records and achievements of a remarkable group. Yet as time passes on John Shaw Billings grows in stature, and it is probable that the centenary of his birth will place him as the greatest mind, the wisest administrator, and the deepest and widest influence among all those who have contributed to the renown of that famous school. Even so, that is not his greatest title to fame; his most original and most enduring work is the Index Catalogue of the Surgeon-General's Library (which had its own centennial celebration two years ago [1]) and the initiation of the Index Medicus. Dr. Welch, himself a distinguished member of the group, more than once pronounced these achievements to be "America's greatest contribution to medicine"; and when we reflect on the vast results which have flowed from the work of Billings in this sphere we should almost be inclined to go a step further and declare that it was the greatest single-handed contribution to medical science made in the nineteenth century. In the April number of the *Bulletin* of the Johns Hopkins Hospital, which is largely devoted to the commemoration of the centenary of Billings, are reprints recounting his career as an army medical officer, the story of his connexion in so many spheres with the Johns Hopkins Hospital, his views on medical education written down in the late 'seventies which illustrate his originality of thought, and his life as a student and professor of the history of medicine.

THE LANCET 100 YEARS AGO

May 19th, 1838, *p.* 244.

From a lecture delivered by Dr. Marshall Hall, at the Theatre of Anatomy and Medicine, Webb-street, Southwark.

THERE is a form of chronic bronchitis which occurs in the hay season, or at least in summer, which has been termed *hay-fever*, or *hay-asthma*, and by Dr. Bostock, who has suffered himself from this malady, *catarrhus æstivus*. . . . Dr. Bostock observes,—"One of the most remarkable circumstances respecting this complaint, is its not having been noticed as a specific affection, until within the last ten or twelve years. Except a single observation of Heberden's, I have not met with anything that can be supposed to refer to it in any author, ancient or modern. . . . Yet, as there appears to be nothing either in the cause or nature of the complaint, which can induce us to suppose that it is actually a new disease, we are obliged to conclude that it had been regarded as a mere modification of the common catarrh. . . . The experience of many years has taught me not to expect a cure for the complaint; so that I now only aim at relieving any peculiarly urgent or distressing symptoms . . . . Bathing the eyes in tepid water, and fomenting the face generally, occasionally applying small blisters to the chest, mild purgatives, small doses of ipecacuanha, Dover's powder, squills, and digitalis, bathing the feet in warm water, a moderate but not spare diet, perfect rest, and carefully avoiding all extremes of heat, comprise the whole of the means that I have found useful to myself."

[1] *Lancet*, 1936, 2, 861, 1286.

[2] Graham, G., and Oakley, W. G., *Arch. Dis. Childh.* 1938, 13, 1.

[3] Eighth Annual Issue. Edited by R. H. P. Orde, O.B.E., and issued under the auspices of the Joint Red Cross Council and the British Hospitals Association. London: Central Bureau of Hospital Information, 12 Grosvenor-crescent, S.W.1. 1938. Pp. 365. 10*s*.

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SPECIAL ARTICLES

THE CHEMOTHERAPY OF BACTERIAL INFECTIONS

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(*Concluded from p. 1129*)

Therapeutic Action

PNEUMOCOCCAL INFECTIONS

PRONTOSIL was originally said by Domagk [39] to have no effect on pneumococci, but Hörlein [82] reported positive experimental results with prontosil soluble. Subsequent studies, which are mainly experimental, with little clinical confirmation, have been devoted mainly to sulphanilamide. Rosenthal [139] found it bactericidal to pneumococci in vitro, and he [138] and others [35] found some curative action in experimental infection in mice, while Gross and Cooper [33 34 65] obtained similar results in rats given actual pneumonia by intratracheal inoculation with a suspension of pneumococci in mucin. It seems clear that Type III infections are more amenable to the treatment than others, a singular fact all the more fortunate since this type is the only one entirely uninfluenced by serum. Apart from single case reports, the only record of clinical trial is that of Heintzelman et al. [74] who treated 9 cases of type 3 pneumonia with only 2 deaths, whereas in 10 cases not so treated there were only 2 recoveries; the alternate case system was not used, and the factors of age, past history, &c., appear to have favoured the treated group. Other experimental studies are those of Schmidt [144] and Kreidler.[93] This treatment appears to have a sound if not sensational experimental basis; further clinical studies are needed. Serum, where also applicable and necessary, should probably not be withheld.

STAPHYLOCOCCAL INFECTIONS

In view of the fact that the first therapeutic success with prontosil ever published (by Foerster [51] as long ago as 1933) was in a case of staphylococcal septicæmia, and of the recognition from the very first that *Staphylococcus aureus* is at least moderately susceptible to this treatment, it is astonishing that so little information on clinical results in this infection has been published. Among brief references to it may be mentioned Colebrook and Purdie's [32] success in 2 out of 3 cases of puerperal staphylococcal septicæmia treated with large doses of sulphanilamide. According to Domagk [41] experimental staphylococcal infection responds better to uleron; adequate clinical verification is so far lacking. It would be of great service in this study if a series of cases of osteomyelitis or carbuncle were submitted to carefully observed treatment; septicæmia has often progressed too far before treatment to afford a fair test.

INFECTIONS OF THE URINARY TRACT

Prontosil was used empirically in Germany for the treatment of *Bact. coli* infections of the urinary tract in both adults [114 160] and children [83 91 130] with uniform success. Later studies of the mode of excretion, and the work of Buttle et al.[22] on the susceptibility of the genus *Bacterium* to the action of sulphanilamide, placed this form of treatment on an intelligible footing. Weiser [163] also records success with prontosil in coccal and mixed infections accompanying urinary obstruction. In the following studies sulphanilamide has been used exclusively, and there seems no reason for believing that prontosil is superior or even perhaps equal to it for this purpose. Kenny et al.[90] treated 46 cases of *Bact. coli* infection, 16 of which were of pyelitis in pregnancy, and invariably secured a sterile urine within a week, often within three days; they point out that sulphanilamide is both cheaper and pleasanter to take than mandelic acid. Their in-vitro tests sometimes showed urines to be less bactericidal than the progress of the patient led them to expect; this was apparently due to adjusting their *p*H to 6·0, which is the average *p*H of normal urine, but not that of urine passed during this treatment, since sulphanilamide, apparently by interfering with the tubular reabsorption of bicarbonate and bases,[109] causes the excretion of an alkaline urine. It has been shown by Helmholz and Osterberg [76] and by Mellon and Shinn [116] that sulphanilamide is much more bactericidal in an alkaline than an acid urine. The further work of Helmholz [75] has done much to clarify the position; it is abundantly clear that, in the urinary tract at least, sulphanilamide is directly bactericidal, and urine containing it destroys added bacteria. This treatment and mandelic acid complement one another, and have separate indications. Mandelic acid requires a highly acid urine and good renal function; sulphanilamide acts best in an alkaline urine, and is effective even in the presence of renal damage. Mandelic acid is effective against *Streptococcus fæcalis* infection, but sulphanilamide fails; mandelic acid is usually powerless against *Proteus* infection, but sulphanilamide succeeds. Another difference is that sulphanilamide can be given in the acute stage. Nevertheless another report [19] from the Mayo Clinic, briefly reviewing results in over 200 cases, advises that mandelic acid should be used where it is applicable, since sulphanilamide is more dangerous, and 15 per cent. of patients cannot take it. This paper also records the observation that in coexisting prostatitis mandelic acid sterilised the prostatic secretion in only 50 per cent. of cases, whereas sulphanilamide did so in 23 out of 24; the drug was demonstrated in the secretion.

MENINGOCOCCAL INFECTIONS

That sulphanilamide protects mice in experimental meningococcal infections was first observed by Buttle et al.[21] and confirmed by Proom,[133] using Miller and Castle's method of inoculation in a mucin basis; Levaditi and Vaisman [100] later reported similar results. There has been substantial confirmation of this effect in the clinical field. Schwentker et al.[149] treated 10 cases of meningitis, with only 1 death, giving 0·8 per cent. sulphanilamide in saline by intrathecal and subcutaneous injection; this series has since [146] been extended to 52 cases with a mortality of 15 per cent., comparable serum-treated cases having a mortality of 30 per cent. Eldahl [45] treated 12 cases in infants with 3 deaths, and lays stress on the importance of intrathecal administration. None of these cases was given any serum, although according to Brown [18] and Branham and Rosenthal [15] combined sulphanilamide and serum treatment is more effective in mice than either alone. Carey [154] also reports 5 successes, in only 1 of which the intrathecal route was used. Pongratz [132] records 3 recoveries after prontosil (2 also receiving serum) and Gehrt [59] the recovery of an infant given enormous

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doses of uleron and no serum. Zendel and Greenberg [166] successfully treated 2 cases of meningococcus septicæmia with prontosil and sulphanilamide. There is thus clear evidence of therapeutic efficacy, but perhaps not yet enough to decide the optimum method of administration or the indications for serum treatment in addition.

GONOCOCCAL INFECTIONS

Its close relationship to the meningococcus justified a supposition that the gonococcus would also react to this treatment. True infection by gonococci is considered unattainable in animals, but Levaditi and Vaisman [101] claim to have produced it, again with the aid of mucin, and to have proved its curability by sulphonamide derivatives. An enthusiastic report by Dees and Colston [37] was the harbinger of a spate of papers on the treatment of gonorrhœa, most of which have appeared during the past few months. It is as if therapeutic enterprise, sated in other directions, has flung itself with renewed energy into another field. To analyse, and even to quote, all these results would occupy a disproportionate amount of space; their judicial analysis is in any case difficult, gonorrhœa being a disease in which the criteria of successful treatment are not readily amenable to exact statement. While almost all authors report good results, there is frequent mention [27 36 44 126] of a minority of patients (10–20 per cent.) who entirely fail to respond; this may be ascribed to the occurrence of resistant strains of gonococci.[49] Among numerical computations of success, O'Hanlon's [125] statement that the average period of invalidity among troops at Aldershot has been reduced from 62 to 21 days carries conviction. He also concludes that the treatment should be begun in the acute stage, a point on which Hering [77] is even more emphatic, while Herrold [78] obtained a better response at a later stage. Practice in connexion with irrigations and other adjuvant treatment varies widely. Hanschell [71] mentions encouraging his patients to take plenty of fluids; this measure reduces the concentration of sulphanilamide in both tissues and urine, and might therefore be expected to militate against success. It is generally agreed that complications, both local and metastatic, respond well, and the rapid disappearance of gonococci from exudates in distant situations as well as the urogenital tract is a usual finding.

Prontosil appears to be less effective in gonorrhœa than sulphanilamide, but according to Domagk [41] and Grütz,[67] three recently synthesised German compounds, one of which is uleron, are superior to sulphanilamide itself. Seven subsequent German papers on uleron all recommend delaying treatment with it in the male for three weeks, in order to allow the bodily defences to be mobilised; four of them mention palsies due to peripheral neuritis as a complication, and two record cases in which there were signs of renal and even hepatic damage. None of these consequences has ever followed sulphanilamide treatment, and it may well be asked whether the alleged superiority of uleron counterbalances such dangers, but it is obviously too early to form a judgment on this subject.

GAS GANGRENE

Long and Bliss [10 103] showed that sulphanilamide protected mice against experimental infection with *Cl. welchii*, and Domagk [41] obtained the same result with uleron. Bohlman's [14] clinical results with sulphanilamide are impressive. Three cases of extensive injury due to car or lift accidents developed gas gangrene in spite of prophylactic antitoxin; all recovered under treatment by oral sulphanilamide, two with dramatic rapidity. Since no further serum was given and radical surgical treatment was not undertaken, the drug appears to have been responsible. This report amply justifies further trial in every available case.

TYPHOID FEVER

In view of the observation by Buttle et al.[22] that sulphanilamide protects mice against infection with both typhoid and paratyphoid bacilli, a useful action in enteric fever might be expected, but there is so far no proof of it. Schmidt's [143] report on the response of 3 typhoid cases to prontosil is unconvincing. Barer [6] records success with sulphanilamide in post-typhoid urinary infection.

UNDULANT FEVER

To assess the value of any treatment in this disease is exceptionally difficult, and an apparent effect needs consistent repetition to assume significance. There are enough favourable reports on cases, mainly on *Br. abortus* infection but including some due to *Br. melitensis*, at least to justify further trial. Francis [55] describes 2 cases and refers to five other papers; he also reports experiments from which it appears that *Br. abortus* is more susceptible than *Streptococcus pyogenes* to bacteriostasis by sulphanilamide in vitro. Further favourable clinical reports are those of Thévenet,[155] Richardson,[136] and Page.[128]

MISCELLANEOUS CONDITIONS

It is still doubtful whether any virus disease responds to this treatment. Reports from the United States that distemper and lymphocytic choriomeningitis will do so have recently been denied by English workers, and Kelson [89] could obtain no effect in experimental poliomyelitis; he also quotes Long as observing that sulphanilamide treatment for other conditions had no effect on concurrent colds; Elyan,[46] on the other hand, says that it regularly aborts them. Lymphogranuloma inguinale, according to Gjurić,[61] responds to sulphanilamide. That protozoal infections may be susceptible is suggested by Hill and Goodwin's [79] success in treating malaria with prontosil; this is confirmed by van der Wielen,[161] who observed it accidentally, having given sulphanilamide for cystitis to a case of therapeutic malaria. Rich and Follis [135] observed marked retardation in the progress of experimental tuberculosis in guinea-pigs treated with large doses of sulphanilamide. The attitude prompting other therapeutic attempts to be mentioned was evidently that of Fagerstrom [47] who writes: "Since this drug appeared to be no respector of bacterial personalities, we decided to test its efficacy on the case at hand"—the drug was sulphanilamide, and the case one of erosive and gangrenous balanitis, with a very mixed flora; it responded to the treatment. Other conditions reported as having been treated successfully are cerebral abscess [142] (bacteriology various), pyelonephritis due to *H. influenzæ*,[1] appendicitis,[43] and bubonic plague,[25] the two former with sulphanilamide and the two latter with prontosil. Some fungi are susceptible in vitro,[58] but there is no record yet of therapeutic trial in any mycosis.

It seems clear from the careful studies of Swift et al.[153] that sulphanilamide is useless in rheumatic fever; Massell [111] reaches the same conclusion. Another negative finding is that of Campbell,[24] who found experimental syphilis to be uninfluenced.

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Prophylactic Use

These compounds have undoubtedly been widely used in order to prevent possible sepsis, especially in the puerperium or after certain operations, but there are few reports on results. Johnstone [88] gave sulphanilamide or proseptasine to 500 women after labour, but it seems doubtful from his data whether it had any useful effect. The indiscriminate treatment of normal cases is probably unjustified. Smith [150] considers that sulphanilamide has no prophylactic value in an epidemic of tonsillitis, presumably because an adequate dose cannot be given indefinitely. There is no reason for doubting that the development of streptococcal infection can be prevented, if the time of its anticipated onset be known. It is a serious drawback, however, that previous sulphanilamide treatment can render the bacteriological diagnosis of any infection which may arise exceedingly difficult, and the same difficulty occurs in established infections treated before such a diagnosis is made. In these circumstances I have found numerous though irregularly staining streptococci in pus, the great majority of which must have been dead and the rest damaged, since they grew slowly, atypically, and very sparsely, only assuming normal cultural characters after several days. In another case repeated failure to find gonococci in material expected to contain them was attributable to the same cause. In view of the fact that the sale of these drugs is unrestricted and their anti-gonococcal action widely recognised, it should be known that according to Felke [48] uleron at least has no prophylactic action against gonorrhœa.

Local Application

The successful action of these drugs depends on their uniform permeation of affected tissues via the blood, and surface application seems a poor alternative. Prontosil, having no demonstrable direct action on bacteria at all, seems not the best choice for this purpose, but German authors claim results from applying it in various skin conditions [8 84] and even from gargling [145] with it. Brown [17] injected it into the pleural cavity in two cases of streptococcal empyema with apparently good results; Nicholson [122] could not reproduce this effect in rabbits, but since all his animals died, however treated, and Gay and Clark [58] have shown that sulphanilamide prevents the evolution of an otherwise fatal streptococcal empyema in rabbits, it may be that he used an excessive inoculum of streptococci. Sulphanilamide was used locally as well as orally by Purdie and Fry [134] for the treatment of two sinuses which had discharged streptococcal pus for three years after a parametritis. The rapid healing in this case indicates that chronic as well as acute infections are amenable to treatment. Theoretically sulphanilamide is preferable to prontosil for local application, and a cavity in which solution can be retained seems a more hopeful site than skin or mucosa.

Other Compounds

Over a thousand related compounds have now been synthesised by the originators of prontosil, and are undergoing experimental trial. Similar work is in progress elsewhere, and interesting information [7 23 54 64] has been published about various compounds not yet generally available. This review must be confined to those which have undergone clinical trial, and of these uleron has already been described. Another is *p*-benzylaminobenzene sulphonamide, known in this country as proseptasine. The earlier work on this compound was done by French investigators,[63 70] who found that although approximately equal to sulphanilamide in therapeutic activity (disputed by Gray et al.[64]), it is much less toxic. The principal experiments on it in this country are those of Whitby,[164] which deal also with a companion product given by injection, disodium-*p* (γ-phenyl-propylamino) benzenesulphonamide-α-γ-disulphonate (soluseptasine). The low toxicity of *p*-benzylaminobenzene sulphonamide for mice has some counterpart in the clinical field, according to Bloch-Michel et al.,[12 13] who treated 180 cases of erysipelas with good results and no untoward effects, and Smith,[150] who compared it with sulphanilamide, slightly to the latter's disadvantage from this standpoint. That it is not entirely non-toxic must be concluded from Model's [120] report of a case of fatal agranulocytosis following treatment with proseptasine; he refers to it as "*p*-aminobenzene sulphonamide"—i.e., sulphanilamide—a mistake which suggests that others may not know these compounds to be chemically distinct. Peters and Havard's [131] results in scarlet fever have already been mentioned. According to both Whitby and Rosenthal et al.[140] *p*-benzylaminobenzene sulphonamide is ineffective against meningococci. It should therefore not be assumed that this compound will always act in the same way as sulphanilamide, and further information about its therapeutic action is clearly necessary.

Toxicity and Toxic Effects

The acute toxicity of prontosil in animals is low, and that of sulphanilamide even lower; doses in excess of those used in therapeutics cause no demonstrable effects whatever. In striking contrast with these negative experimental findings are the numerous toxic effects which have been observed in man. Apart from mere sensations such as nausea, dizziness, and depression, which are common, the following effects may be produced, some frequently, others fortunately rarely.

ACIDOSIS

Clinically obvious acidosis has been observed by Southworth [152] and by Long and Bliss [103] and some degree of it is a necessary accompaniment of sulphanilamide treatment, unless counteracted by giving alkali. An explanation of this and of the alkalinity of the urine is offered by Marshall et al.,[109] who have shown that 70 to 80 per cent. of the drug in the glomerular filtrate is reabsorbed in the tubules; they suggest that this process interferes with the reabsorption of bicarbonate and base. No renal damage occurs, and existing nephritis is not a contra-indication.[4]

CYANOSIS

Whereas sulphæmoglobinæmia, first recognised by Colebrook and Kenny,[30] was originally thought to be an infrequent complication, Discombe [38] showed that some degree of it, though often insufficient to cause cyanosis, is the rule during sulphanilamide treatment. Paton and Eaton [129] discuss the effect of sulphates in precipitating sulphæmoglobinæmia, and record also the occurrence of methæmoglobinæmia; they discuss the treatment of the two conditions. Archer and Discombe [5] explain the occurrence of sulphæmoglobinæmia as due to catalysis by sulphanilamide of the reaction between H_2S and hæmoglobin; measures for averting it are directed to preventing the absorption of H_2S from the bowel, and include a low residue diet and the avoidance of all purgatives except liquid paraffin. Marshall and Walzl [110] have recently offered evidence that cyanosis may sometimes

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be due to a cause other than the formation of either met- or sulph-hæmoglobin. Clinical reports of cyanosis and its treatment are numerous; it can evidently often be disregarded, and disappears on stopping the drug or even without doing so.

FEVER AND RASH

A bout of fever, varying in severity, may occur, usually from seven to ten days after sulphanilamide treatment is begun; it is important to distinguish this from a recrudescence of the disease. Hageman and Blake [68] saw this in 21 out of 134 cases, and 9 of these also had a maculopapular erythema of wide distribution. They comment on the resemblance of this condition to serum sickness, but in common with most other authors, and as would be expected, could obtain no evidence of sensitisation to sulphanilamide. It seems much more probable that the fever is a reaction to the products of lysed bacteria. Schwentker and Gelman [148] also give a full account of the condition, and there are several other American reports, mainly on its occurrence in ambulatory cases of gonorrhœa, some of whom had been sun-bathing. This, and the occurrence of the rash mainly on exposed parts, suggested photo-sensitisation as its mechanism, and evidence in favour of this is now furnished by Rimington's [137] observation that patients and rats given sulphanilamide excrete an excess of porphyrin.

AGRANULOCYTOSIS AND ANÆMIA.—MISCELLANEOUS

Agranulocytosis and anæmia are the most serious complications of sulphanilamide treatment, and the former stands alone in having caused a number of deaths. The paper of Jennings and Southwell-Sander [87] is the best source of information on this subject; they report one personal case and analyse the features of four others. It is noteworthy that in all these five cases administration had been prolonged, and their occurrence affords strong reason for limiting a course to a fortnight, if not less. This disaster is evidently due to idiosyncrasy; many patients have been similarly treated and even given much larger quantities with no ill effect. Special care in debilitated patients is necessary, and frequent blood counts are advisable during prolonged treatment, but Young's [165] case shows that this is not an adequate safeguard, since repeated counts were being done, and that preceding the development of a complete and fatal agranulocytosis gave no indication of its imminence. Some failure of erythropoiesis may accompany this condition or occur apart from it. Harvey and Janeway [73] and Kohn [92] record cases of acute hæmolytic anæmia during sulphanilamide treatment; this condition develops much earlier (between the third and seventh days) and is amenable to treatment.

Miscellaneous.—Bucy [20] attributes a case of toxic optic neuritis to sulphanilamide. Jaubert and Motz [85] allege impairment of spermatogenesis following its use in gonorrhœa.

Conclusion

This account has described the position of chemotherapy with sulphonamide derivatives, as far as I have been able to ascertain it, at the present day. Further extension and definition of its uses will doubtless add to or supersede some of the conclusions arrived at here, possibly within a very short time. Advances are likely in two directions. One is the better employment of existing remedies; it will be noted that several types of infection, among them scarlet fever, pneumonia, enteric fever, wound infections, and staphylococcal infections, have apparently not yet been made the subject of adequate therapeutic trial, while in others optimum dosage and mode of administration remain to be defined. The other line of advance lies in the introduction to therapeutics of new compounds now only in the stage of laboratory trial. It is highly significant that, among these, specificity for individual bacteria varies with chemical structure. Any clue to the mechanism underlying this may place in our hands the means of successfully combating many, perhaps even all, bacterial infections; this goal may indeed eventually be reached by the present laborious method of empirical trial either in the experimental animal or in the human patient. So much ground remains to be explored that extensions of great consequence in the scope and efficiency of this treatment may certainly be expected.

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MEDICINE AND THE LAW

Cash Damages for Shortened Expectancy of Life

THE two latest decisions as to the cash value of lost expectancy of life are impossible to reconcile. It is a pity that Parliament, when in 1934 it passed the statute which creates these problems, did not specify a tariff of awards for the different ages and sexes. In Shepherd *v.* Hunter a common jury awarded £90 for loss of expectation of life in a case where a boy aged three had been knocked down by a motor-car and had died ten minutes later. The Court of Appeal has now said that this sum was clearly inadequate and has ordered a new trial. Within a few days a common jury awarded £1000 on the same ground in Bailey *v.* Howard. A little girl aged three was in a perambulator outside her father's house. A motor-car, negligently driven, collided with it and inflicted injuries from which the child died next day. Mr. Justice Charles, before whom the case was tried, observed that the damages were "very excessive." He himself would have assessed them at £150. He granted a stay of execution with a view to an appeal. These are two cases of three-year-old children. In one the Court of Appeal finds the award of £90 so grossly inadequate that it takes the strong step of ordering a new trial. In the other the judge thinks that £150 is the proper sum.

In each case the tribunal declared that Parliament had presented the court with a problem which it was impossible to determine accurately. Although the estate of the deceased person might not have lost a penny by the death, the administrators or executors were to have the same remedy as the deceased person would have had if still alive. The jury, said the Court of Appeal in Shepherd *v.* Hunter, were entitled to take into consideration that a healthy child of three years had a substantial expectation of life. A medical witness, said Mr. Justice Charles in Bailey *v.* Howard, had told them that at three years of age a child had the highest expectation of life. Parliament had put on them the duty of looking into the unknown; the jury must make a guess. There was no guide. Of two judges one might give a £5 note, the other might give £10,000. "It is sheer guesswork." How, one wonders, do juries manage their guessing? Does one persuasive juryman dominate his fellows, or do all twelve write down their guesses and is the total added up and divided by twelve?

Dairies and Typhoid Fever

The case of Square *v.* Model Farm Dairies (Bournemouth) Ltd., decided after several days' hearing before Mr. Justice Lewis last week, was a sequel

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to the typhoid fever outbreak at Poole and Bournemouth in August, 1936. Mr. Square and his family spent their summer holiday in Dorsetshire and were supplied with the defendants' milk daily. Mrs. Square, her two children, her niece, and the children's governess contracted typhoid fever. The defendants had invited the family's custom by circularising them with a brochure commending their milk as clean and pure. The plaintiffs said that, by the issue of this brochure and by letter, the defendants expressly and impliedly warranted that their supply of milk was clean and free from contamination and infection, whereas the milk was in fact infected with germs of typhoid fever so that the warranty was broken. Apart from this, the plaintiffs alleged negligence (failure to take proper precautions to ensure that the milk was pure) and even fraud. All these causes of action failed. There seemed no dispute that the typhoid was due to the defendant's milk and that the infection came from milk produced on a smallholding which was part of a certain farm. This milk was mixed at the defendants' central depôt with milk from other sources of supply. The judge held that the tenant of the smallholding was in no way at fault; his buildings were good, his herd was well kept, his dairy utensils were above reproach, and no complaint could be made of his personal cleanliness. The stream from which his cattle drank was infected, but he himself did not and could not know of the infection. The managing director of the defendant company was also absolved; he was an enthusiast for pure milk; he knew all his farmers and their methods; his inspections were adequate. The system of mixing the milk from various sources in one container ("bulking the milk") was held to be a proper commercial method and not in itself negligent.

There was still, however, one other cause of action on which Mr. Square and his family could rely. Under the Food and Drugs (Adulteration) Act nobody is to sell to the prejudice of the purchaser any article of food which is not of the nature, quality, or substance demanded by the purchaser. On this line of attack Mr. Square succeeded. He had asked for clean and pure milk and the defendants had supplied him with milk which was infected with the germs of typhoid fever. There remained one or two points of a novel kind to be decided. The Food and Drugs (Adulteration) Act made it an offence to do what the defendants had done. The defendants could have been prosecuted and fined. But could they also be sued in damages? Yes, said the judge; they had committed a breach of a statutory duty, and an action would lie against them, even though the statute, in creating the duty, expressly specified the penalty. The next doubt was whether, if there was a right of action, anybody other than "the purchaser" could sue. The judge held that anybody had a right to sue who suffered damage from the sale of food of an inferior quality. Lastly there was the fact that the defendants were entirely unaware of the presence of the bacillus in the milk; they could not have known of its existence. Did this fact affect their liability? The judge decided, in accordance with earlier decisions, that, although the defendants were entirely innocent morally, they were guilty of a breach of the Food and Drugs (Adulteration) Act. The result is important for dairy companies. If the disease is milk-borne, their legal liability would seem to be inevitable.

INNS OF COURT.—On May 11th Dr. J. A. Struthers (Inner Temple) was called to the bar.

AN INTERNATIONAL ACADEMY OF POST-GRADUATE MEDICINE

IN 1909 an international committee for medical post-graduate work was formed during the sixteenth International Congress of Medicine in Budapest, and Prof. Waldeyer of Berlin was elected president. This committee held its first meeting in 1913 during the seventeenth International Congress of Medicine in London, with Sir Donald MacAlister in the chair, but it never met again and to-day few of its members are alive.

Last August the German State Organisation for Post-graduate Medicine convened a congress in Berlin, at which delegates from 44 nations decided to found an International Academy of Post-graduate Medicine. The preparatory committee convened a special congress in Budapest for the ceremonial constitution of the Academy, and this has just been held, with 106 delegates representing 20 States. The objects of the Academy as set forth in the constitution are:—

1. To arrange for an international congress on post-graduate medical education to be held every four years.
2. To render readily available to all nations the most recent results of scientific research and medical experience.
3. To provide for post-graduate training of doctors in all countries and to furnish information to authorities and organisations working in the field of hygiene and public health.

The Academy intends to pursue this aim by all expedient means, as for example by the exchange of teachers and students, by planned tours of study, and by the exchange and publication of literature. The headquarters will be in Berlin.

The international committee consists of the delegates from the countries participating. The presidential board is composed of the president, five vice-presidents, and the members of the permanent bureau. The vice-presidents each represent a different country. Prof. M. Borst (Munich) was elected president and the following as vice-presidents: Prof. Raffaele Bastianelli (Rome), Prof. M. Tieffeneau (dean of the faculty of medicine, Paris), Colonel A. H. Proctor (dean of the British Postgraduate Medical School, London), Prof. H. Olivecrona (Stockholm), and Prof. Arcze (Buenos Aires). Dr. Blome was elected president of the permanent bureau with Prof. C. Adam (director of the Kaiserin Friedrich Haus) as general secretary and Dr. Pütz as treasurer.

The opening session of the Academy took place in the ceremonial hall of the Hungarian Academy of Sciences. The opening speech was delivered by Prof. Borst; then came the representatives of the Hungarian Government followed by the mayor of Budapest, Dr. Karl Szendy; and after this there were speeches from Prof. Bastianelli, Prof. R. Leriche (Paris), and Colonel Proctor. Dr. Blome reviewed the tasks and aims of the International Academy and Prof. Borst concluded with an address entitled An Ideal for the Doctor.

The scientific meetings were held on April 25th, 26th, and 27th in the Semmelweis hall of the Royal Medical Society. Papers were read by Prof. Olivecrona, Prof. G. von Bergmann, Prof. A. Szent-Györgyi, Prof. Leriche, Prof. Bastianelli, and Mr. A. S. Parkes, F.R.S. It is hoped that the establishment of the Academy will benefit the health of every nation and simultaneously advance international friendship and collaboration amongst the medical profession in all countries.

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PARIS

(FROM OUR OWN CORRESPONDENT)

B C G VACCINATION

A REPORT entitled "Twelve Years of Tuberculosis Prophylaxis with B C G Vaccine" was presented on April 6th to the French Academy of Medicine by Dr. Guérin on behalf of a general practitioner of the Loiret Department, Dr. Rodon, who since 1925 has administered B C G by the mouth to 328 babies. Only 89 of them had at some time or another lived in a tuberculous milieu; Dr. Rodon's extension of B C G vaccination to the other babies is defended on the assumption that what is harmless for the potentially tuberculous child must surely be so for other children. With a rare diffidence in matters statistical, he confided his data to Monsieur Moine, the statistician of the French National Tuberculosis Committee, who has compared the mortality among Dr. Rodon's 328 vaccinated children at different ages with the mortality at the same ages among children in the Loiret Department alone and also in the whole of France. The comparison works out very much in favour of the B C G children, but Monsieur Moine would like to handle many more data, such as those supplied him by Dr. Rodon, before giving B C G praise without reserve.

Another B C G study has recently been undertaken by Dr. R. Chaussinand of Saigon. He gave B C G by the mouth to 128 babies belonging to the European community which lives in an exceptionally tubercle-free milieu, the Europeans who develop tuberculosis usually being repatriated, and the native servants being carefully examined for signs of tuberculosis before being engaged. It was thus possible to follow closely by means of tuberculin tests, both Pirquet and Mantoux, the development of an allergic response to the B C G without much fear of the conclusions drawn being stultified by accidental infections with virulent tubercle bacilli. It was found that a positive Pirquet reaction developed in only 19 per cent., and even when as much as 1 centigramme of tuberculin was given by intradermal injection, the proportion of positive reactors was no more than 46 per cent. Two years after vaccination the percentage of positive Mantoux reactions began to decline till, five years after vaccination, there were no more positive reactors. Dr. Chaussinand takes for granted that the tuberculin reaction is the only means of demonstrating the presence of "premunising" germs in the subject vaccinated. Judged by this standard, both the efficiency and duration of B C G vaccination, effected by the oral administration of B C G, seem to be still rather far from the ideal.

GRAINS AND SCRUPLES

Under this heading appear week by week the unfettered thoughts of doctors in various occupations. Each contributor is responsible for the section for a month; his name can be seen later in the half-yearly index

FROM "SILVER DOCTOR"

III

THE crossword puzzle has come to stay, or so it seems. Originally started as a competition for prizes, it captured America, swept across no small part of the civilised world, and for a time the British press was raddled with illustrations of smiling cross-worders receiving monstrous cheques. All this has changed and nowadays crosswords no longer are news. Yet they persist. Their familiar chessboard patterns continue to adorn a host of our journals, and their devotees have grown into a legion that never will be numbered. Prize-seekers have been replaced by gentler enthusiasts, and the game has developed into an intellectual recreation.

It is altogether surprising to find how widely this pastime has spread among the intelligentsia of the present day. Its followers include politicians, financiers, captains of industry, students, sportsmen, soldiers, sailors, lawyers, doctors, women who work and women who frivol, clubmen, and retired folk from any or every occupation. Enthusiasts appear in the most unlikely quarters and in a description of this year's boatrace heroes one read that Mr. X was a crossword devotee!

Crossworders are inconspicuous folk who claim no insignia and are content to practise their hobby in more or less solitary silence. In public they may be recognised in railway carriages, on steamer decks, or in places where men write. Young, middle-aged, or elderly, they include every variety of man or womankind, and each member of the clan shows a characteristic self-absorption while at work. There is a peculiar attitude of quiet happiness in these people and invariably the crossworder's eyes betray him; wary and intelligent, puzzled yet pleased, they show a far-off intentness rarely seen on other faces. By their eyes ye shall know them!

* * *

The tools of the craft are sparse. A newspaper in varying degrees of demolition, a pencil, a morsel of indiarubber, and something of a dictionary constitute the essentials. An amazing literature of reference books exists for the use of specialists, and rumour hints of optimists who work with fountain pens! Crossworders exhibit an infinite variety in their method of attack. There are anagrammers, quotationists, geographical people, and multiple-word lovers who make swiftly for their particular prey, inspiration folk who dart hither and thither as the spirit directs, and dull plodders who struggle with each number in turn. Each seeks salvation in his own way.

Of course there are crosswords *and* crosswords, silly ones for simpletons, and cunning conundrums for connoisseurs. A puzzle for every performer. The addict selects the type which appeals to his taste, becomes a regular subscriber to the journal in which it appears, and henceforth his happiness depends on its daily solution. Thousands of such addicts exist in Great Britain. Without infringing the law of libel it may be urged that the *Times* and *Daily Telegraph* are not entirely free of responsibility in this connexion.

* * *

The peculiar attraction of crosswords remains an enigma. The average individual either loves or loathes them, and as a rule the first impression persists. Their usefulness is as undoubted as their success is surprising. They serve as a pleasing recreation for the leisured, a definite means of education, an antidote to the dullness which creeps over middle-aged brains,

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and a stimulant to a desirable nimbleness of wits. As mental gymnastics they make for mental fitness. There is something characteristically British in the picture of the crossword host, gallantly doing its "daily dozen" up and down the country without the stimulus of prizes or publicity, content with the reward of good work well done. The joy of craftsmanship is not dead!

There remains to be mentioned yet a further value of the crossword. Modern society is beset by bores, male, female and neuter, and for these plagues the crossword puzzle possesses an almost unnatural attraction. This ensures their occasional diversion from their normal avocations for which we cannot be too thankful.

Finally, one would record a note of respectful admiration for crossword composers whose state of mind must often be represented by the typical example of their ingenuity—"nearly a crossword (4 letters)."

* * *

Under "hobby" my dictionary presents the following definitions: "a strong active horse; a pacing horse; a subject which one is continually setting off; a favourite pursuit." Cutting out the horses and most of the cackle, I would claim that the "favourite pursuit" of any individual is an important index to his character. During many years of consulting practice I used to inquire the hobby of every male patient, often with surprising results. A man's hobby is a keynote of himself. The astonishing diversity of the hobbies of mankind offers a tempting study but leads into deep psychological waters, since likes and dislikes merge imperceptibly into pathological propensities. It is a truism that every worker should cultivate a "favourite pursuit," an interest to occupy his leisure, if he would keep mentally and physically at his fittest, yet how many men fail to follow this common-sense rule. How frequently one hears such futilities as "my work is my hobby" or "I've no time for hobbies." Sooner or later these poor fish grow dull and stale. Unfortunately too, a time comes when a man cannot forge an interest, and there are few more pitiable objects than he who seeks but cannot find a congenial pursuit. Proverbially the cobbler's child often is the worst shod, and doctors without a hobby are too common. Nor was there ever a time when hobbies to suit all varieties of age, physique, inclination, circumstances, or purse were so easy of access. You pays your money—sometimes a lot of money—and you takes your choice.

* * *

I have played many games, revelled in a variety of outdoor sport, but first, last, and all the time I have been a fisherman; surely the healthiest, most engrossing and restful of all the hobbies. The fascination of angling shows itself as a rule in early years. Never shall I forget my first fishing at the ripe age of seven, nor the pride with which I carried home four small perch wrapped in water-lily leaves. Since then there have been many other expeditions but none more rapturous. I recall wadings and waitings for Scottish salmon, long happy days of trout-fishing, sunrises after Thames chub, evenings among Avon roach, dappings on Irish loughs, pike-spinning in every variety of water and weather, fly-fishing for the great rainbows of New Zealand and Canada, and long days among Pacific rollers in search of deep-sea monsters. Sometimes success has come and sometimes failure, but always an abiding delight.

Angling is a sport which in one form or other can be enjoyed at any age and by all sorts of men. Many writers have pondered its unique spell. Izaak Walton wrote in 1653 in the "Compleat Angler":—

"Doubt not, Sir, but that Angling is an Art and an Art worth your learning. The question is rather, whether you are capable of learning it? for angling is somewhat like poetry, men are to be borne so: I mean with inclinations to it, though both may be heightened by discourse and practice."

The late Dr. Henry Van Dyke summed it up in a fine sentence:—

"There is nothing that attracts human nature more powerfully than the sport of tempting the unknown with a fishing line."

Grey of Falloden in his "Essay on the Fly-Fisherman" wrote:—

"The pleasure of angling is not limited to fly-fishing though this may be the most exquisite part of it. All anglers know what this pleasure is; it is too comprehensive and pervading to be described within the compass of words; it is too subtle in some of its forms to be analysed; too intimate to be explained; to those who are not anglers it cannot be conveyed or made intelligible. But surely as life draws to a close no one can look back on days of recreation with more certain gratitude than he who has had the opportunity of . . . fishing and has been born with the gift of enjoying angling."

* * *

Angling offers a host of unique attractions. It is pleasantly unstereotyped with an endless variety in its methods, which demand a considerable skill. It is an open-air pastime pursued in complete freedom; we fish when and where we can, alone or in company and in any costume we choose. It is an individual job and each angler busies himself in his chosen way. It offers a constant liveliness, an activity without hurry to be enjoyed at one's own pace. It is sufficiently engrossing to shut out life's worries, quiet enough to be restful, yet possessed of a background of continuous excitement. It is comparatively independent of the weather and its physical strain can be adapted to the angler's powers. What other sport combines such advantages? Angling takes one into the clean, quiet places of the earth, where one gets close to nature. Every angler comes in time to know that there is more in fishing than catching fish. He senses the wonder of the Infinite, expressed through the birds, the flowers, the rocks, the clouds, the sunrises or sunsets, the song of the wind and the music of running water. Moreover there is the mystery of the unknown which gives a kick to every cast and a zest to every fishing expedition. Life offers some great sensations, but there are few to beat the thrill of the first rush of a heavy fish at the end of one's line. Years ago in an East-End fishing-tackle shop I asked a chimney-sweep "Do you like fishing?" The little man looked me straight in the eyes, "Liking ain't no word for it Guv'nor, I fair loves it." So do I.

* * *

A man's hobby must be something which his soul loves. Nor is its value measured only by the hours spent in its indulgence, since no small part of its benefit comes from pleasurable anticipation of joys to come or happy memories of past triumphs. Such relaxations afford relief to restless brains at unexpected times. How often have I gone to bed with a mind jaded and sleepless from medical worries, when pleasant thoughts of a day's sport have wiped the slate clean and sent me into sound sleep.

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CORRESPONDENCE

SULPHANILAMIDE IN BACTERIAL MENINGITIS

To the Editor of THE LANCET

SIR,—In his article on the treatment of meningococcal meningitis, published in your issue of March 26th, Eldahl makes certain statements which suggest that he does not realise that the group of drugs now being used against bacterial infections contains distinct different chemical compounds and cannot be grouped together indiscriminately.

In quoting the work of Marshall, Emerson, and Cutting (*J. Amer. med. Ass.* 1937, **108**, 953) on the passage of sulphanilamide into the cerebral spinal fluid of both dogs and human beings, he notes that these experiments were made on healthy animals and humans. He states that if the meninges are infected very little sulphanilamide passes from blood to spinal fluid. He apparently has not seen a subsequent paper by Marshall, Emerson, and Cutting (*J. Pharmacol.* 1937, **61**, 196) in which they showed that no difference appeared to exist in the passage of sulphanilamide into the spinal fluid of normal human beings and those suffering with meningococcal meningitis. Also, we have information that many other workers have confirmed the rapid passage of sulphanilamide from blood to spinal fluid in concentrations only slightly lower than those in blood in patients where the meninges were inflamed.

He quotes Jauerneck and Gueffroy (*Klin. Wschr.* 1937, **16**, 1544) in regard to its passage into the spinal fluid as stating that "in patients with meningitis one or two days may elapse before the sulphanilamide can be demonstrated and that the concentration in many cases is very small (0·01 mg. per 100 c.cm.)." A careful perusal of the paper by Jauerneck and Gueffroy shows that a slow passage from blood to spinal fluid was found for the red dyestuffs, Prontosil base (sulphamido-chrysoidine), and Prontosil soluble (4′ sulphonamido-phenyl-2-azo-1-hydroxy-7-acetylamino-naphthalene-3 : 6 disulphonic acid) but not for sulphanilamide (*p*-aminobenzenesulphonamide). It seems reasonable to suppose that, if any change is caused in the passage of a substance from blood to spinal fluid when the meninges are infected, this change will be in the direction of greater passage rather than less. We have taken one of our normal dogs in which we had previously studied the distribution of sulphanilamide between blood and spinal fluid and injected prontosil soluble subcutaneously. Samples of cerebral spinal fluid taken by cisternal puncture at three and six hours after injection showed only the faintest trace of pink, while a sample of serum taken at six hours was coloured deeply red by the dye. Prontosil soluble and sulphanilamide react entirely differently as regards their passage from blood into cerebral spinal fluid.

The fact that sulphanilamide readily passes from blood to spinal fluid when given by mouth or by injection establishes its value when given by these routes in treating bacterial meningitis. Whether combined intrathecal therapy with per os or subcutaneous administration of the drug is or is not superior to per os or subcutaneous therapy alone is a question that must be decided by clinical study.

We are, Sir, yours faithfully,

E. K. MARSHALL, Jun.,
W. C. CUTTING.

Department of Pharmacology and Experimental Therapeutics, Johns Hopkins Medical School, Baltimore, U.S.A., April 30th.

HEARING-AIDS FOR DEAFNESS

To the Editor of THE LANCET

SIR,—It would be a very great pity if the recent letter by Mr. Macleod Yearsley were to influence any of your readers to advise their deafened patients against the use of a hearing-aid on the grounds that its permanent use slowly but surely increased their deafness. His statement that the permanent use of an aid may result in the important listening function being thrown into abeyance is on a par with objecting to the use of spectacles because they interfere with the exercise of the power of accommodation.

The severely deafened patient lives in a silent world, and however much he would like to exercise his listening powers he is prevented from so doing because everyday sounds are unable to penetrate to his conscious sense of hearing. A modern hearing-aid of the valve-amplifying type is capable of giving as much as 60 decibels of more or less even amplification in that part of the sound spectrum in which speech sounds occur. This is equivalent to about a 50 per cent. increase, and is more than enough to enable the majority of deafened patients to listen to what they most desire—namely, speech. By using such an aid they can rejoin the family circle, continue their work, enjoy in their leisure moments those entertainments that depend upon sound; they can feel that they are no longer a burden upon those with whom they come into daily contact, and above all, it gives them something to which they can listen. In the case of the less severely deafened a good aid hinders the inevitable progress of their deformity, inasmuch as it prevents their hearing apparatus from deteriorating because of disuse. It increases the scope of and thus exercises their listening powers. It also relieves the strain on the larynx and the patience of their relatives and kind-hearted friends who are trying to keep them from gradually retiring into their silent shell.

With regard to the other points that have been raised in this correspondence, I feel that there are others more competent than I to deal with them. I would, however, like to clarify the rôle of the otologist in the prescribing of a hearing-aid. I feel very strongly that not only should he prescribe which class of aid is most likely to benefit his deafened patient, but that he should take steps to see that the hearing-aid supplied to his prescription by a retailer is the most suitable one available. In addition he should furnish the hearing-aid retailer with the necessary information concerning the nature of the hearing defect, so that as far as possible the aid may be matched to the hearing loss.

I am, Sir, yours faithfully,

TERENCE CAWTHORNE.

Harley-street, W., May 16th.

ELECTROSURGICAL OBLITERATION OF THE GALL-BLADDER

To the Editor of THE LANCET

SIR,—Dr. Pribram's communication in your issue of March 26th calls for an analysis and correction of certain statements.

(1) Pribram states that he developed a technique which he has used since 1924. His first communication on it appeared in the *Medizinische Klinik* in July, 1928 (**24**, 1147), when he called the procedure "mucoclasis." After a lively discussion on his address before the Surgical Society of Berlin he

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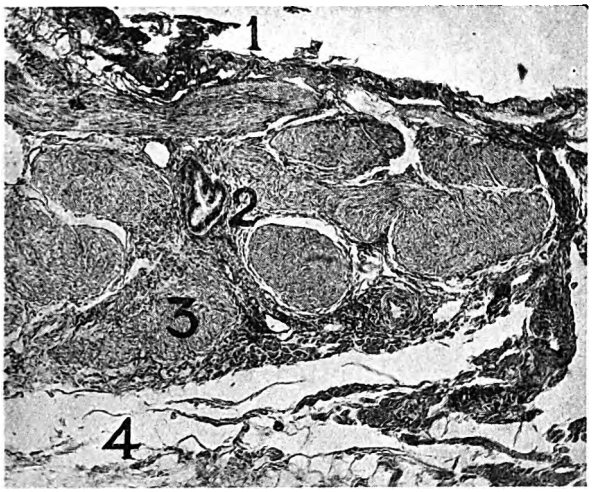

FIG. 1.—Effects of forced carbonisation on wall of inflamed gall-bladder. (1) Eschar. (2) Rokitansky-Aschoff sinus in transverse section. (3) Muscularis. (4) Serosa. Note excellent state of preservation of layers of gall-bladder past the mucosa.

wrote in 1928 (*Zbl. Chir.* **55**, 773): "It is a fact that partial burning of the mucous membrane of the gall-bladder with the Paquelin cautery has formerly been practised by various surgeons in order to avoid the formation of fistulas." Thus it is evident that "charring" and "carbonisation" of the mucous membrane of the gall-bladder is not a new procedure but that Pribram adopted it from others and called it "mucoclasis."

(2) It is obvious that Pribram misinterprets the meaning of the term "electrocoagulation" and that he confuses it with "carbonisation" (charring). He uses these terms interchangeably without differentiation. Permit me to cite what he says in the *Zentralblatt für Chirurgie* (1929, **56**, 1054):—

"Originally I used the ordinary Paquelin burner to 'carbonise' the mucous membrane of the gall-bladder. However, it was insufficient in action. I therefore used Hadenfeld's 'hot iron' such as was used in Bier's clinic. Its burning effects were excellent but it had two drawbacks: first, it produced too much heat in the abdominal cavity. Second, I was fearful of explosion while giving ether. I, therefore, used a diatherm apparatus known as the Penetrotherm. This apparatus chars and carbonises excellently. . . . In cases where the mucous membrane is hypertrophic and the carbonised area thick, I curette it off with a sharp spoon."

"I want to point out," continues Pribram, "that only superficial action is desirable, and therefore the electrode should barely touch the mucous membrane and not be pressed against the mucosa; if superficially touched, small sparks will be seen to fly which destroy the mucous membrane at once."

Pribram, therefore, advises and intentionally produces carbonisation by means of fulguration, which is not coagulation and which is an entirely different procedure having entirely different effects on the tissues. As I have pointed out in my previous writings and in your issue of Jan. 1st, a carbonised film definitely prevents further penetration of the current for deeper action and such destruction by carbonisation remains superficial and is limited to the mucous membrane (Fig. 1).

(3) The conclusions of my recorded researches did not apparently influence Pribram to depart from his ancient method of carbonisation; for at the International Congress on Lithiasis held at Vichy in 1932, he said: "The principles of my method which I call 'mucoclasis' consist of burning the mucous membrane with an electric current. . . . The burnt crust which results can be scraped off with a curette." Even as late as 1935 he continues his method unchanged and his writings remain barren about coagulation as the surgeon understands it. It needs, of course, no further emphasis that "burning" and "scraping" have nothing in common with electrocoagulation.

(4) I have pointed out (*Illinois med. J.* 1933, **64**, 425; *J. Amer. med. Ass.* 1934, **103**, 169; *Arch. phys. Ther.* 1935, **16**, 207, and 1937, **18**, 278) that carbonisation of the mucous membrane as suggested by Pribram is often followed by regeneration. Such regeneration springs from remnants of the lining of the Rokitansky-Aschoff sinuses (Luschka's glands) in the same manner as curetted uteri become relined with endometrium (Figs. 2 and 3).

(5) I find no justification for Pribram's condemnation of the use of the falciform ligament in the gall-bladder bed. He offers no proof, histologic or otherwise, in support of his statement. It is regrettable that he completely ignores the excellent work of Kuntzen and Vogel (*Arch. klin. Chir.* 1931, **164**, 39) and others who have shown that electrocoagulated surfaces develop a positive chemiotaxis to serous surfaces to which they become firmly agglutinated. I have stressed the excellent protection the falciform ligament affords not only on electrocoagulated surfaces but wherever a serous covering is desirable—e.g., for reinforcement of suture lines along the intestinal tract; over the inverted, closed duodenal stump; for the suture lines of perforated gastric and duodenal ulcers; in gastro-jejunostomy; and in surgery of the bile-ducts (*Amer. J. Surg.* 1935, **30**, 389; 1936, **31**, 467) (Fig. 4).

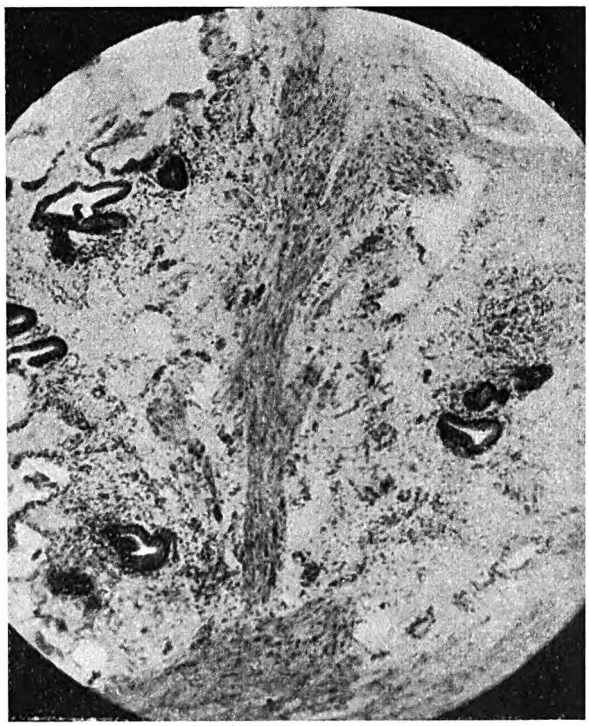

FIG. 2.—*Reason for failure of mucoclasis.* Chronic cholecystitis eight months after mucoclasis (electrocarbonisation) of the mucosa. Note remnants of Rokitansky-Aschoff sinuses and diffuse round-cell infiltration. Below, in centre of field, an aggregation of polymorphonuclear leucocytes. Persistence of symptoms. Relieved by total obliteration of gall-bladder wall by electrocoagulation. (× 65.)

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(6) With reference to drainage, researches have shown that drainage is inimical to surfaces which have been treated by electrocoagulation. L. R. Whitaker (*New Engl. J. Med.* 1935, **213**, 596) operated as recommended by Pribram, coupled with drainage, with a resulting mortality of 18·75 per cent.! Reluctance in closing the abdomen after my method even in frankly infected cases of the gall-bladder is, as experience has proven, unwarranted. An eminent colleague of London writes me: "I am now closing the abdomen without drainage in practically all my cases and the results seem to justify your confidence in the method. I am delighted with the operation."

(7) In his latest contribution (*Zbl. Chir.* 1936, **63**, 1506) Pribram, while still speaking of mucoclasis, adopted important steps of my procedure: (1) evacuation of the gall-bladder with a special two-way syringe; and (2) introduction of an antiseptic into the gall-bladder. He no longer speaks of "sparking," "burning," and "charring"; thus he deviates from his original mucoclasis procedure and decidedly resorts to important steps of my method.

(8) I find it difficult to reconcile some of Pribram's statements in *The Lancet* with the following facts.

(*a*) After the appearance of my report to the *Illinois Medical Journal* in November, 1933, he wrote to the editor of that journal: "Thorek aims, if I understand him rightly, to destroy all the infected parts, the residual infection being one of the main causes of recurrent troubles after operation. . . . For this reason Thorek insists upon the total electro-coagulation of the gall-bladder and its bed for the purpose of destroying deep seated foci of infection. . . . Thorek's conclusions seem to be logical."

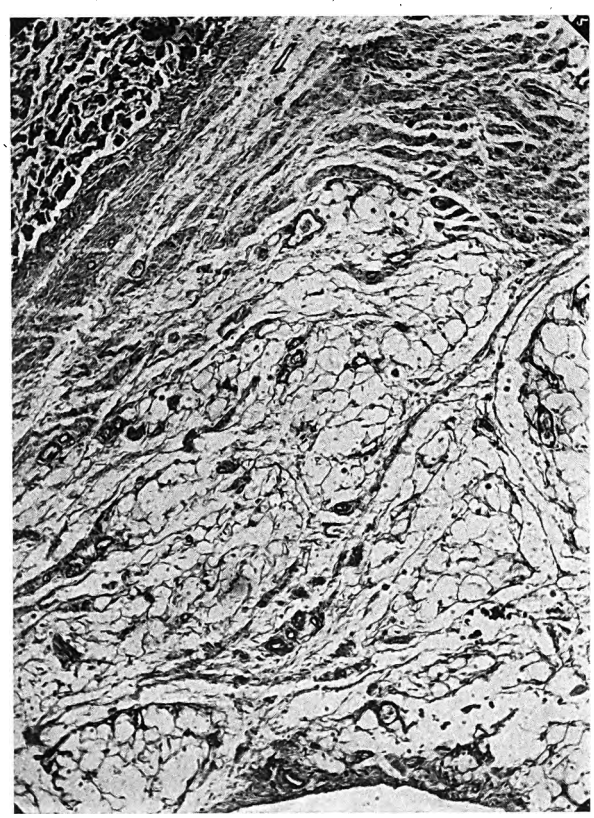

FIG. 4.—Transplantation of completely detached falciform ligament eighteen months after electrosurgical obliteration of the gall-bladder. Observe normal histologic appearance of liver structure. All that remains of the gall-bladder bed is a strip of connective tissue. The transplanted falciform ligament shows its characteristic normal structure. (Low magnification.)

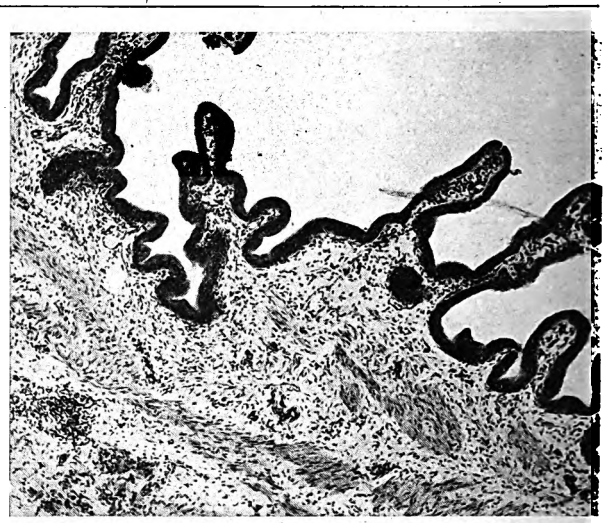

FIG. 3.—*Reason for failure of mucoclasis.* Chronic cholecystitis nine months after electrocarbonisation of mucous membrane of gall-bladder (mucoclasis). No relief of symptoms. Regeneration of mucous membrane and persistence of inflammation (round-cell infiltration, &c.) Relieved by electrocoagulation of entire gall-bladder wall. (× 120.)

(*b*) In his latest article in the *Zentralblatt für Chirurgie*, he writes: "At all events Thorek's experiments have definitely proven that in operations on the gall-bladder by electrosurgical means the healing process, particularly in infected cases, is much improved."

(*c*) L. R. Whitaker whom Pribram quotes (*New Engl. J. Med.* 1930, **203**, 718) stresses: "The method of Thorek emphasizing contact coagulation to considerable depth seems preferable to fulguration. I am grateful to Thorek for the distinction and wish to emphasize the necessity for real contact coagulation." These are distinct contradictions of his other statements.

(9) Pribram's latest teachings that the diseased gall-bladder should be left behind because the liver harbours micro-organisms needs no comment except to point out that one does not hesitate to remove an infected appendix because the adjacent bowel is filled with pathogenic micro-organisms; nor does one refrain from attacking a tuberculous focus because of the adjacent bowel being infested with pathogenic micro-organisms; nor does one abstain from attacking a tuberculous focus because of the presence of tubercle bacilli elsewhere in the body; neither is one loth to proceed surgically where indicated in syphilitic lesions because of a positive Wassermann reaction.

My conclusions may be summarised as follows: (1) Pribram's procedure of burning the mucous membrane is an old method for which he coined the term "mucoclasis." (2) A careful survey of the literature will establish the fact that "electrosurgical obliteration of the gall-bladder," which I have described, is an entirely different procedure. (3) After Pribram had attended my address and motion-picture demonstration at Vichy (September, 1937) I was led to believe that he was fully convinced of the difference in the two procedures. (4) Finally, I note with gratification that in his last article he has adopted many of the important and basic steps of my operation and that he no longer speaks of "charring" and "burning" or "cauterisation" but aims as he says at "a dry, electrocoagulated surface." I hope he soon will make use of the excellent protective quality of the falciform ligament, abandon drains, and subscribe to the respected dictum of *palmam qui feruit merat.*—I am, Sir, yours faithfully,

Chicago, April 14th. MAX THOREK.

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REFORM OF THE LUNACY LAWS

To the Editor of THE LANCET

SIR,—I have read with great interest the excellent leading article in THE LANCET of May 14th entitled Doctors and the Herbert Act. In the discussion which followed Mr. Latey's able paper on the medico-legal aspects of the Matrimonial Causes Act, 1937—at the April meeting of the Medico-Legal Society to which you refer—I stated that I considered the Act should have been preceded by a Bill for the reform of the existing laws relating to the certification and detention of persons of unsound mind, and putting these laws on a safe, sure, and up-to-date scientific basis. I expressed the opinion that *before* any person should be certified as of unsound mind and detained in an asylum that person should be examined by a panel of mental experts, not more than five or less than three; the family doctor being present as a witness, to give evidence only. The decision of the panel would be a majority judgment, signed in the name of the panel. Every twelve months during detention the patient would be examined by a *different* panel of mental experts, the institutional doctor being present as a witness, to give evidence only; the opinion of the panel as to curability to be stated on each report.

In this way errors of diagnosis and prognosis, based on the opinion of one or two medical men in charge of the patient, would be eliminated. The onus and responsibility of giving an opinion as to curability would be placed on the panels of experts appointed by the State. Under the existing lunacy laws a newly qualified medical man with no real practical experience of mental disease can certify a person as a lunatic and order his detention in an institution, in the case of a pauper, and on an urgency certificate without any other medical certificate except his own. No person, even if he be a pauper, should be certified and detained as a lunatic, even for one week, on the certificate of one medical man. The law in this respect should be amended, requiring in every case two medical certificates from medical men who have been in practice at least three years. This should be done pending a complete reform of the laws relating to certification.

The present state of affairs is neither fair to the public nor to the medical profession.

I am, Sir, yours faithfully,

Cemaes Bay, Isle of Anglesey, May 15th. J. L. MOIR.

MATERNITY CARE FOR UNMARRIED WOMEN OF THE PROFESSIONAL CLASSES

To the Editor of THE LANCET

SIR,—May I bring to the attention of all members of the medical profession the work of the Fellowship of St. Michael and All Angels? This society exists (and it is the only one of its kind) to help girls of the professional classes who are in grave moral difficulties. It maintains three homes—a training home, a maternity home, and a nursery.

Doctors realise how difficult life is for many girls from sheltered and comfortable homes (daughters of schoolmasters, clergymen, solicitors, doctors, and so forth) who have to go out into the world unfriended and alone, and they know how many of these, working as hospital nurses, teachers, art students, &c., fall victims to unregulated passion under conditions sometimes more pitiable than blameworthy. But it must often happen that when consulted by such girls, who from their upbringing and position are obviously unsuitable for the care of ordinary rescue homes, they are at a loss how best to advise them.

The maternity home of the Fellowship is situated very conveniently in a healthy part of South London, and has recently been enlarged and admirably equipped to satisfy the latest requirements of the Health Department of the L.C.C. Girls are admitted some time before the birth of the child, and remain for 4 months afterwards under the best conditions both physical and spiritual. After that time if the girl has to return to business life the child is sent either to a thoroughly trustworthy foster-mother, or to the nursery home of the society.

I am encouraged to write in this way because doctors who do know about the Fellowship and advise girls to apply to it testify to its admirable work and influence. But we feel that we could be even more useful than we now are if more doctors knew of what we do for this particular class of girls in need.

Letters should be addressed to the Hon. Secretary, 5, Bloomfield-terrace, London, S.W.1.

I am, Sir, yours faithfully,

May 16th. PERCY BLACKBURN.

*** We have ascertained that there is accommodation for 10 prospective mothers in the maternity home, that the usual fee, inclusive of nursing attention, is 2 guineas a week, and that the fees of the doctor attached to the home, should her services be required, are very moderate. Special consideration is given to girls quite unable to pay the usual fee.—ED. L.

PROSTIGMIN AND INTESTINAL MOTILITY

To the Editor of THE LANCET

SIR,—In the annotation on p. 1119 of your last issue it is stated that the doses of Prostigmin employed by the American investigators, Harger and Wilkey, "were similar to those used by Carmichael and his colleagues (namely, 1–2 c.cm. of 1/4000 prostigmin methyl sulphate)."

To prevent accidental overdosage, however, permit us to point out that the experiments carried out by Carmichael and his colleagues under the auspices of the Medical Research Council, and reported in THE LANCET of May 5th, 1934, were undertaken with the standard 1 c.cm. ampoules, each containing 0·0005 g. prostigmin, or a 1/2000 solution, whereas Harger and Wilkey used ampoules containing a 1/4000 solution, known in America as "prostigmin prophylactic," and corresponding to one-half of the standard prostigmin ampoules with which British practitioners are familiar.—We are, Sir, yours faithfully,

ROCHE PRODUCTS LTD.

Bowes-road, London, N., May 17th.

MEDICAL STUDENTS CONFERENCE.—The second annual conference of representatives of medical student societies has been arranged by the Medical Students Committee of the National Union of Students and will be held in London from July 12th to 15th. The general subject for discussion will be the training of the doctor. Lord Horder will be the guest of honour at the inaugural dinner, which will be held at Pinoli's Restaurant, Wardour-street, London, W., on July 12th. Sir Henry Brackenbury will be the first speaker at the formal sessions which begin the next morning, and in the afternoon Prof. C. A. Lovatt Evans, F.R.S., will speak on the relation of pre-clinical subjects to the medical curriculum as a whole. On Thursday the first speaker will be Mr. E. Pearce Gould, and in the afternoon Prof. W. W. Jameson will open a discussion on the teaching of preventive medicine. The whole of Friday will be devoted to clinical visits to the Middlesex Hospital, University College Hospital, and the Royal Free Hospital. Further particulars may be had from the secretary of the committee, 3, Endsleigh-street, London, W.C.1.

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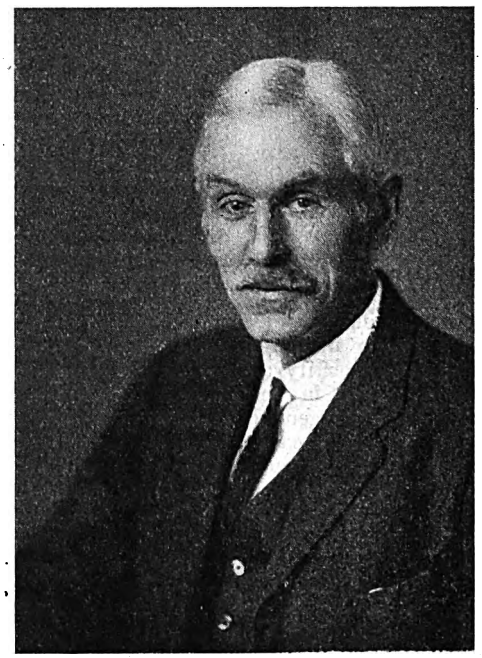
OBITUARY

A. E. BOYCOTT, D.M.Oxon., F.R.C.P.Lond., F.R.S.

Prof. Boycott died on May 12th at Ewen Farm House, near Cirencester, where he had been living in retirement since he resigned in 1935 the Graham chair of pathology at University College, London. His breakdown in health had entailed a prolonged stay at a sanatorium, after which the prospect of a happy rustication had been set aside by the extension of tuberculosis to the spine. For many months his ardent spirit had been immobilised.

Arthur Edwin Boycott was born at Hereford in 1877, the second son of William Boycott, solicitor and prominent conservative, and Mary Mellard his wife. He went to the cathedral school where he gained some distinction as a runner and cricketer, and—a more unusual pursuit—he catalogued the county snails. He entered Oriel College, Oxford, as a senior classical scholar, when Phelps was provost. He took a first class in classical moderations, which enabled him in later life to be a ruthless censor of inelegant latinity, and then turned to medicine, becoming in turn senior demy of Magdalen and fellow of Brasenose. The technique of the histologist Gustav Mann moved him to emulation and he worked with Burdon Sanderson upon the effects of cooling on the excitability of nerves. It was Burdon Sanderson who suggested to Boycott that he should consider research as a profession, and the three were Phelps's companions on his famous country walks. Boycott obtained a Fraser research scholarship, and took a first in the honours school of natural science, then doing some work on conduction in nerve under Gotch and later James Ritchie (who became his lifelong friend), but did not pursue that subject further.



Photograph by Elliott & Fry

From Oxford Boycott went on to St. Thomas's from which he qualified B.M. Oxon. in 1902 and was then house physician to T. W. Acland who impressed him as a teacher rather than as a clinician. This period in the house was Boycott's only link with clinical medicine, although he remained deeply interested in the clinical temperament without analysing it. From St. Thomas's he went to the Lister Institute as assistant bacteriologist. In the course of routine work on enteric infections he gave the first description of paratyphoid C. At the Institute he again met J. S. Haldane for whom he had a great regard; he appreciated and shared Haldane's precision and reticent deduction, while like him at heart a mystic, always probing into the unknown. With Haldane he went to Cornwall to investigate the miners' anæmia which was then ascribed to defective ventilation. Together they demonstrated the ankylostome eggs in the stools of underground workers in Dolcoath mine at Camborne, and the excess of eosinophils in their blood. They defined the diagnosis, treatment, and prevention of a disease which, in Boycott's words, was probably responsible for more unhappiness and inefficiency than any other parasitic infection. He reviewed the whole subject in the Milroy lectures of 1911, tracing its origin to the visits of mining engineers from tropical countries.

In 1903 he took the final decision to adopt pathology as his life work and succeeded Ainley Walker as Gordon lecturer in pathology at Guy's Hospital, where he continued his work on the toxicity of intestinal worms. When Haldane undertook to advise the Royal Commission on Diving about caisson-disease he commissioned Boycott and the naval engineer, Captain Damant, to test his theory of decompression. The experiments were complicated and the disentangling of the results needed all Boycott's clear-headedness and honesty. It was his most complete piece of work. Many problems arising out of caisson-disease were investigated in the succeeding years, and with C. G. Douglas he applied Haldane's CO method of measuring blood volume to animals with far-reaching results. A paper on the size and growth of the blood in rabbits was Boycott at his best.

In 1913 Boycott was appointed to the chair of pathology at Manchester, where he continued his work on nephritis and on the regulation of the blood volume and composition of the tissue fluids in normal and nephritic animals. He was then awarded the F.R.S. At this time his presidential address on the nature of viruses to the pathological section of the Royal Society of Medicine gave rise to much discussion. The mental atmosphere of Manchester was congenial to him but not the climate, and in 1915 he accepted the Graham professorship of pathology in the University of London. This was the first whole-time chair of pathology at University College where the association of pathology and clinical medicine had always been particularly close, and there had grown up a school of pathological physiology after the manner of Cohnheim with a clinician at the head of it. Boycott slid easily into the position for he had so nearly himself been a physiologist. But it was war time; he was at first largely taken up with work on the health of munition workers committee and when he applied for a commission in the R.A.M.C. he was sent to Porton. Here his pacifist sympathies were troubled by work which in itself he found intensely interesting, and it was made tolerable to him only by the friendly informal atmosphere of the place. On Armistice day he returned home and resumed work in London, finding time to publish a series of papers on the genetics of the left-handed spiral in molluscs. When the Rockefeller Trust offered a large sum of money for enlarging the medical school he accompanied C. C. Choyce on a visit to the U.S.A. to bring back whatever they found best there in the design and

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equipment of special departments. A few years later he was invited to open the new pathology department at McGill when the LL.D. was conferred on him. He then met Peyton Rous and started another productive friendship.

Boycott was joint secretary with James Ritchie of the Pathological Society of Great Britain and Ireland when it was founded in 1906, and was one of the group of members which purchased the *Journal of Pathology and Bacteriology* in the following year. He was assistant editor for sixteen years under Sims Woodhead and later under Ritchie and then was editor himself for ten years. All his erudition and wide reading, his knowledge of biological, physiological, and pathological problems, his insistence of the importance of the statistical method, were brought to bear on this labour of love. He succeeded to a fine tradition and enhanced it. When he took over the editorship the number of manuscripts submitted for publication steadily increased, in spite of the high standard he demanded. He had his foibles, such as his economy in the use of capital letters and commas and his frank detestation of duplicate publication, but he brought the journal to a standard of excellence which has been the subject of comment the world over, and many writers owe much to his critical comment on their contributions. He was regular in attendance at the meetings of the Pathological Society and often intervened in discussion with remarks which though penetrating were also illuminating and constructive. For his own communications he rarely used notes. He knew what he wanted to say and said it crisply. His writing was a thing apart, his direct and pellucid English recalling that of Huxley. Thoughts arranged themselves logically in his mind and he was unconscious of effort in putting them to paper, so that many consecutive pages of manuscript could go straight to the printer without a correction of any sort. This made him beloved in the editorial department of this and other journals enriched by his contributions. His letters to his friends had the same quality and spontaneous finish.

The qualities of a saint have somewhere been defined as the readiness to help always and everywhere, combined with an unexpected sternness as occasion arises. Boycott came very near to the universal helper. Any humble inquirer for biological information was welcomed and rewarded, and he was generous of that most treasured possession, his leisure time. After moving from Manchester to Radlett in 1915 he was a frequent attender at the meetings of the Hertfordshire natural history society and often led field excursions. He was always ready to encourage younger workers and never seemed too busy to find time to help the weaker brethren in the study of natural history. But towards false reasoning or what he considered wrong ideals Boycott was impatient. Right and wrong stood out in his mind like white and scarlet. To one so austere there was no borderland. How often have his friends seen him flash out and astonish some worthy man with a widish borderland, who, imagining that he was throwing a commonplace into the conversation, had to Boycott proclaimed damnable, heresy! He was intolerant of any sort of compromise in social and political problems and was apt to antagonise those who did not realise his essentially kindly disposition. Nor did he ever spare himself in the prosecution of his professional work, and of nothing was he more intolerant than of his own physical infirmities. Moreover he was apt to expect the same thing of others. Such a temperament must lead sometimes to a sense of frustration, if not of futility, and the New Year letter of greeting to one of his friends was almost sure to contain the postscript "another misspent year."

Prof. Boycott married in 1904 Constance, daughter of Colonel Agg of Cheltenham. There were two sons of the marriage, the elder of whom is Dr. John Boycott, pathologist to St. George's Hospital.

Sir Charles Martin, F.R.S., writes: "I first met Boycott some forty years ago at Oxford. I was spending a week-end with John Haldane and his wife and on Sunday evening he joined us at supper. He had recently graduated in the science schools and was then occupied with Haldane in some research concerned with blood volume. I was much charmed by the personality of this recent recruit to physiology and impressed by his wide scientific outlook and uncommon precision of statement. Thus began a friendship which lasted until his death and was founded upon our common admiration and affection for Haldane.

"I did not see Boycott again until I returned from Australia to occupy the position of director of the Lister Institute five years later. Meantime he had qualified, and had shown his capacity for independent scientific investigation. In 1904 he accepted an invitation to a position in the bacteriological department of the Institute which left him time for his own researches and provided facilities for carrying them on. Boycott was very happy at the Lister Institute and though, to our regret, he left after three years, many of his colleagues of those days remained his lasting friends. His association with the Institute was re-established twenty years later when he became a member of its governing body and took an active part in guiding its destiny.

"Boycott's scientific output during the few years spent at the Lister Institute was great. His experiments on the effects of temperature, moisture, and air movement upon body temperature were carried out in a large hot-room which was converted for the purpose into a primitive air-conditioning chamber. The experiments were made by Haldane, Damant, and Boycott upon themselves and those of us who could be induced to volunteer. Looking back, it is surprising what a lot of valuable information was obtained with this modest equipment. Following this work came a series of researches on the effect of increased atmospheric pressures upon animals and man; for this work the Institute was able to provide a suitable equipment largely owing to the munificence of the late Dr. Ludwig Mond. Recognition of Boycott's share in the discoveries on caisson-disease and the methods of decompression of divers has been somewhat obscured by the fame of the senior partner. Haldane originated the inquiry and had the larger share in planning the experiments but they were actually carried out, for the most part, by Boycott and Damant.

"After Boycott left the Institute to return to teaching posts he necessarily became involved in organisation and the administration and direction of research, and the amount of time and energy left over for his own researches was limited. He felt his professional responsibilities keenly and spent much of his time in the study of pathology in order to be in a position to give a well-balanced presentation of this science to his pupils. He soon became recognised as one of the most generally learned pathologists in the country and one possessed of the soundest judgment to whom to appeal when seeking information. Such appeals

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were always generously responded to but, perforce, his output of discovery diminished.

"Boycott was always a naturalist and during the last ten years of his life devoted much of his time and energy to a research in inheritance. For this purpose he employed a species of snail, some members of which have a right-handed staircase and others a left-handed one. The effects of breeding the one with the other were readily observed as the characteristic is easily discernible. Large numbers of observations could therefore be provided for subsequent statistical analysis. Begun as a hobby, this research became a serious preoccupation. The diversion of so much energy from pathology was regretted by some of his friends, but I understand from geneticists that the work has yielded results of value and importance.

"A man of wide knowledge and understanding, Boycott pursued knowledge for its own sake. Indeed, this singleness of purpose became exaggerated until he regarded with suspicion a quest which might lead to results of some immediate usefulness. He had a keen appreciation of good writing and wrote with peculiar literary charm. He had a well-trained penetrating mind. No one, after listening to a meandering discussion, could better gather together the essential points and express the position with greater precision. He loved quiet controversy and could convey a provocative criticism with humour and whimsicality and as he was an interested listener as well as a good talker he was a charming companion. He was terribly upright and refused compromise. This rigidity sometimes amounted to intolerance and impaired his influence. He also had some quaint antipathies. For many years he would have nothing to do with motor-cars and until the last abhorred wireless. Both of these inventions he regarded as spoiling civilisation. The combination of wide sympathies with unexpected prejudices in the mental make-up of this gifted lovable creature was understood by his intimate friends who could appreciate the former and make allowance for the latter. To me, whom he regarded as inclined to perfidy, he was a considerate and affectionate friend and his death has removed one of the best human associations which has come into my life."

THOMAS CHETWOOD, M.B. Lond., D.P.H.

Dr. Thomas Chetwood, chief school medical officer at Sheffield, died suddenly at his home in Sheffield on May 11th after a heart attack. He was born in 1876 and was educated at Epsom and at the London Hospital, where he was house physician and senior clinical assistant. Later he was district surgeon to the City of London Lying-in Hospital and to the Metropolitan Hospital, and was in general practice in London for nine years. He was appointed deputy medical officer of health at Sheffield in 1912 and chief school medical officer two years later, and has since been lecturer in hygiene at Sheffield University. He was a man of alert and vigorous mind and considerable powers of organisation, which have stood him in good stead in coping with the constant expansion of his department. He took a special interest in the problems of the delicate child and in the advancement of open-air schools. He leaves a widow, a son, and a daughter.

SIR THOMAS FLITCROFT, L.R.C.P. Edin.

Thomas Evans Flitcroft was born at Bolton in 1861, was educated privately in Derbyshire, and studied medicine at Glasgow and Manchester. Qualifying in 1883, he married the daughter of William Evans, proprietor of the *Manchester Evening News*, and started to practise in his native town, where he came to hold every civic office of importance. Entering the council in 1892 he became vice-chairman of the sanitary committee and chairman of the hospital committee, and finally was mayor in 1926–28. He was a member of the insurance committee and of the asylums board for Lancashire and president of the Certifying Factory Surgeons' Association. During the late war he presided over the medical war committee and was in charge of the Bolton V.A.D. hospitals. For nearly thirty years he sat as a magistrate for the borough. He was in his seventy-seventh year.

PROF. ISMAR BOAS

WE have to record the death in Vienna of Prof. Boas, author of "Diagnostik und Therapie der Magenkrankheiten" and long an acknowledged leader in dietetics and gastro-enterology. The following note is by one of his oldest pupils, Prof. Walter Zweig:

"He was born on March 28th, 1858, and after a short period of general practice he joined the Augusta Hospital in Berlin as assistant to Prof. Ewald, and there began his fruitful scientific career. Soon after the introduction of the stomach-tube by Kussmaul, Boas and Ewald together devised the test-breakfast and so laid the foundation of all subsequent research on the physiology and pathology of gastric secretion. To-day, nearly fifty years later, the Boas-Ewald test-breakfast is still the standard method of estimating secretory activity in many clinics. Boas soon founded a polyclinic for gastro-enterology, and here in two small rooms he continued independently his scientific investigations with most important results. Doctors came from every country to attend Boas's lectures, and before long his reputation spread as a clinician to such an extent that he became the most famous living gastro-enterologist. At this period he published a text-book on diseases of the stomach and intestines, of which nine editions and translations into many languages were subsequently published. For many years indeed it was the most popular of all books on the subject.

"It is not possible in this place to refer to all of the scientific papers which Boas wrote. The discovery of lactic acid in the gastric contents in carcinoma was one of the most important, but many valuable papers were also written on occult blood, the existence of which he was the first to observe. He continued to investigate this subject up to the last few months of his life. The injection treatment of hæmorrhoids, which originated in America, was improved by Boas, who used alcohol for the purpose.

"In 1898 he founded the *Archiv für Verdauungskrankheiten*, which later came to be known as Boas's *Archiv*, and in 1920 he established the German Gastro-Enterological Society, which meets alternately in Berlin and Vienna and has been attended by physicians from every country. In 1936 he left Berlin for political reasons and went to Vienna, where he continued his scientific investigations in the hospital of which I was the senior physician. With youthful energy he worked on the porphyrin question and published his results in a number of papers. He told me that he was arriving at a method of distinguishing the porphyrins by spectroscopic examination which he believed would help greatly in the differential diagnosis of ulcer and carcinoma. When finally political upheaval reached Vienna, the master, still full of energy and nearly eighty years old, lost all desire to live and gained a happy release."

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Sir ARTHUR NANCE, who has died at the age of 77 at Bantry, Co. Cork, was principal medical transport officer to the Admiralty at the end of the late war, and was made C.B., and K.B.E. in 1919. Born at Eccleshall, Staffs, in 1860, the son of James Nance, F.R.C.S., he was educated at Trent College and qualified from St. Bartholomew's Hospital in 1882. He entered the Royal Navy two years later, and retired with the rank of surgeon captain. Before becoming principal he had been for four years naval medical transport officer for Scotland.

Colonel GEORGE JEROME KELLIE, whose death occurred on May 10th at Guildford, qualified at Edinburgh in 1876, and entered the Indian Medical Service in the following year. He served with the Burmese Expedition of 1888–89 and was present at the capture of the Arhanga Pass ten years later, for both of which he was decorated. After becoming colonel in 1905 he was appointed P.M.O. of the Jullundur Brigade with summer headquarters at Dalhousie.

He was in his eighty-fifth year.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS

Registration of Stillbirths

IN the House of Commons on May 13th, when the Registration of Stillbirths (Scotland) Bill was read a third time, Mr. MAXTON said the measure was presented by its promoters as a contribution to the solution of the problems of maternal mortality, maternal morbidity, and infantile mortality. He did not think it was a contribution to any of those problems. The principal argument for keeping these statistics in Scotland was that they had been kept in England for 70 years. During that time there had been no greater improvement in the infantile mortality or maternal mortality figures in England with statistics than in Scotland without such statistics. If there were brought forward a measure which would make a concerted study of how many of these stillbirths were due to malnutrition, how many to the mother being overwrought, and how many to accidents, a measure which would lead them intelligently along the road to a vast diminution in the number of these stillbirths, then he would say it was worth doing.—Major NEVEN-SPENCE, the hon. Member in charge of the Bill, said that Mr. Maxton would deny the means of getting information about the very things in which he was interested. There had been a complete revolution in the attitude towards these matters. Where the emphasis was formerly placed on the curative side it was now placed more on the preventive side. The whole of our public health system to-day was built up on the vital statistics which were so carefully collected. The House might get some idea of the magnitude of the problem from the fact that in the period 1931 to 1933 the number of stillbirths notified exceeded the combined total of deaths from diphtheria, whooping-cough, scarlet fever, and measles. If they took together the number of stillbirths and the number of deaths within seven days after birth they found that of every 100 women who passed the twenty-eighth week of pregnancy, seven in this country were destined to produce either a stillborn child or a child that died within a week. That was an appalling figure.

Night Baking

On the motion of Dr. HADEN GUEST the Baking Industry (Hours of Work) Bill (which embodies a proposal for a trade board and proposals for the limitation of night baking) was read the third time and passed in the House of Commons on May 13th.

Medical Services in Africa

Mr. M. MACDONALD, Secretary of State for the Colonies, informed Mr. SORENSEN that there were 122 European and 16 African doctors employed by the Government in Nigeria. On the Gold Coast, 74 European and 10 African doctors were also employed by the Government. Information regarding non-Government doctors was not available.

In the House of Lords on May 16th Lord HORDER introduced the Funeral Directors (Registration) Bill, which was read a first time. On the same day the Baking Industry (Hours of Work) Bill and the Registration of Stillbirths (Scotland) Bill (which have passed through the House of Commons) were also read a first time.

QUESTION TIME

WEDNESDAY, MAY 11TH

Anti-Poison Gas Research

Mr. LIDDALL asked the Home Secretary in what manner and to what extent, whether by financial grant or otherwise, his department coöperated with university and similar investigating authorities undertaking research into problems of protection against and treatment of conditions produced by poison-gas warfare.—Mr. GEOFFREY LLOYD, Under-Secretary, Home Office, replied: The Home Office makes a contribution to the cost of the Chemical Defence Research Department of the War Office which has recourse where practicable to the services of the authorities to which my hon. friend refers.

Mr. LIDDALL asked the Home Secretary whether he was satisfied with the efficiency of the gas-protective clothing at present recommended by his department; whether he was aware of the recent successful experiments, conducted at the London School of Hygiene and Tropical Medicine, into an improved fabric more resistant to blistering gases and permitting prolonged muscular work to be done in clothing of this new material; and if he proposed to take immediate and full advantage of this technical development.—Mr. GEOFFREY LLOYD replied: The gas-protective clothing recommended by the Home Office represents the best and most suitable clothing which was readily available at the time it was adopted. Its limitations are recognised and continuous effort is being made to improve it. A demonstration at the London School of Hygiene of an alternative type of suit was witnessed by representatives of the service departments and the Home Office, and the Home Office is advised that it does not consist of an improved fabric more resistant to blistering gases, but incorporates a device intended to permit more prolonged muscular work to be done. It is at present undergoing official tests, and pending their completion it would be premature to take any decision as to its adoption.

THURSDAY, MAY 12TH

Medical Commissions in Territorial Army

Mr. LIDDALL asked the Secretary for War whether he was aware that, in regard to the granting of medical commissions in units of the Territorial Army, applications were considered only from medical men resident in the immediate vicinity of such units; and whether, as this method of selection deprived the Territorial Army of the services of many keen and able officers, he proposed to alter this system.—Sir V. WARRENDER, Financial Secretary to the War Office, replied: It is clearly in the interests of both that medical officers should reside as near as possible to the units to which they belong or are attached. The recruitment of officers for the Royal Army Medical Corps, Territorial Army, is proceeding very satisfactorily.

Nutritive Value of Tinned Cooked Food

Mr. LIDDALL asked the Minister of Health whether, for the guidance of the public, he would make an authoritative statement as to the nutritive value, or otherwise, of tinned

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cooked foods in view of the diverse views held by medical authorities on this subject.—Sir KINGSLEY WOOD replied: I am not in a position to make any detailed statement on the matter referred to. I may say, however, that the results of research already carried out and still in progress are such as to suggest that the nutritive value of tinned cooked foods is generally similar to that of the corresponding foods cooked in the ordinary way.

Health Insurance and Dental Benefit

Mr. TEMPLE MORRIS asked the Minister of Health whether his latest statistics showed any increase in the granting of dental benefit by approved societies; how many such societies gave such benefit; and how many did not.—Sir KINGSLEY WOOD replied: The answer to the first part of the question is in the affirmative. In Great Britain 5400 approved societies and branches, with a membership of 13,070,000, have included the benefit in their current additional benefit schemes; 350 societies and branches, with a membership of 1,730,000, have additional benefit schemes which do not include dental benefit, while 1150 societies and branches, with 1,960,000 members, have no disposable surplus from which additional benefits may be provided.

MONDAY, MAY 16TH

Voluntary Patients and Mental Treatment

Mr. LYONS asked the Minister of Health (1) whether he was satisfied that local authorities were making adequate use of their powers under the Mental Treatment Act of 1930 to provide proper hospital treatment for mild mental cases which would not entail detention in lunacy; and (2) whether he was aware of the unnecessary suffering which might be caused to persons afflicted with mild mental disorder who sought voluntary treatment and who thus had to enter lunatic asylums; and whether he would consider what steps could be taken to ensure other residential treatment in the circumstances.—Sir KINGSLEY WOOD replied: Many local authorities are providing for the treatment of voluntary patients by the establishment at their mental hospitals of admission units, which are separate from the main institution but where all the resources of the hospital can be applied to the treatment of early cases. The number of persons presenting themselves for voluntary treatment at public mental hospitals has grown every year since the Mental Treatment Act came into force. Last year the voluntary admissions amounted to 8414, which was 31·3 per cent. of the total admissions to those institutions.

Mrs. TATE asked if the hon. Member was aware that the real difficulty was that there was an acute shortage of medical men trained in the treatment of these cases; that one of the few clinics for training medical men in this way was the Tavistock Clinic which was only supported by voluntary contributions, and that there was urgent need of a larger supply of trained medical men.—Sir F. FREMANTLE asked if the Minister's reply included any statement in regard to the invaluable out-patients' departments which were being established.—No further reply was given.

Food Inspection

Sir RALPH GLYN asked the Minister of Health whether there was any regulation by which control and inspection of food offered for sale in a room of a dwelling-house could be carried out in the same way as perishable foodstuffs were supervised in shops.—Sir KINGSLEY WOOD replied: Food offered for sale in a room of a dwelling-house is subject to the same public health control as that sold in shops. It may be inspected and condemned if unsound or unwholesome, and it may be sampled for analysis.

"Dedication" of Medical Patents

Mr. DAVID ADAMS asked the President of the Board of Trade whether steps were being considered to reform the patent system in this country, either in the direction of compulsory dedication of scientific discoveries to the public, or otherwise, so as to ensure to the public the benefits of discoveries made in scientific laboratories and to prevent the undesirable exploitation, inter alia, of patent drugs.—Captain WALLACE, Parliamentary Secretary to the Board of Trade, replied: Section 38A of the Patents and Designs Act, 1907 to 1932, already contains special provisions designed to make medical patents more readily available to the public. Proposals for the amendment of the law by making compulsory the "dedication" of medical patents were fully considered by a departmental committee on the Patents and Designs Acts in 1931, who reported against any such amendment. The reasons for their conclusion are stated in paragraphs 185–201 of their report (Cmd. 3829), to which I would refer the hon. Member, and there appears to be no sufficient grounds for reopening the question of amending the Patent Law in this respect.

Incapacitated Persons and Workmen's Compensation

Mr. RHYS DAVIES asked the Minister of Labour whether he was aware that employers and premium insurance companies were in some cases using undue influence to force incapacitated persons in receipt of full workmen's compensation to declare themselves fit for light work, so that the amount of workmen's compensation might be thus reduced, and the liability which ought to fall on insurance companies might come ultimately on unemployment insurance funds; and whether he will take steps to avoid the funds of the unemployment insurance scheme being thus exploited.—Mr. ERNEST BROWN replied: I was not aware of this practice. I should be grateful if the hon. Member would send me any details he may have.

TUESDAY, MAY 17TH

Milk Tests in Scotland

Mr. JOHNSTON asked the Secretary of State for Scotland whether he was aware that during the year 1937 out of 354 test samples of milk taken by the health authorities in the city of Aberdeen 95 were found to be adulterated; whether this adulteration was the highest percentage in the large burghs of Scotland, and that similar test samples of milk taken in the county of Aberdeen disclosed adulteration of over 56 per cent. of the samples taken; whether this was the highest ratio of adulteration among the counties of Scotland; and if he could give any reason for this state of affairs.—Colonel COLVILLE replied: In the case of the city of Aberdeen the 354 test samples referred to—which are not formal samples taken for the purposes of the Food and Drugs Acts—included 208 samples taken from a single herd at its owner's request; and 87 out of the total of 95 samples found to be under standard were from this herd. In the case of the county of Aberdeen the test samples in question were taken with the object of securing improvement in the quality of the milk from byres where formal samples already taken for the purposes of the Acts had been found to be under standard. In neither case, therefore, can a valid comparison with other areas be made.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED MAY 7TH, 1938

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 1 (Gravesend); scarlet fever, 2078; diphtheria, 995; enteric fever, 8 (32 "expected"); pneumonia (primary or influenzal), 1222; puerperal pyrexia, 187; cerebro-spinal fever, 21; acute poliomyelitis, 4; acute polio-encephalitis, 1; encephalitis lethargica, 9; dysentery, 49; ophthalmia neonatorum, 98. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on May 13th was 4736, which included: Scarlet fever, 777; diphtheria, 1047 (carriers 48); measles, 1630; whooping-cough, 285; puerperal fever, 14 mothers (plus 12 babies); encephalitis lethargica, 283; poliomyelitis, 1. At St. Margaret's Hospital there were 23 babies (plus 7 mothers) with ophthalmia neonatorum.

Deaths.—In 126 great towns, including London, there was no death from small-pox, 1 (0) from enteric

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fever, 32 (13) from measles, 3 (0) from scarlet fever, 16 (2) from whooping-cough, 27 (3) from diphtheria, 50 (13) from diarrhœa and enteritis under two years, and 54 (8) from influenza. The figures in parentheses are those for London itself.

Liverpool reported the only death from typhoid. Measles proved fatal in 14 great towns, Sheffield having 3 deaths. Birmingham reported 4 deaths from whooping-cough, Liverpool 3. Diphtheria was fatal in 21 great towns, none reporting more than 2 deaths.

The number of stillbirths notified during the week was 340 (corresponding to a rate of 45 per 1000 total births), including 66 in London.

TYPHOID AT HAWICK.—Up to last Saturday 89 cases of typhoid had been reported at Hawick, including 4 suspects under observation. One death has occurred, that of a young woman clerk aged 21. The more recent cases have not been so predominantly among women. Drumlanrig Home, which was formerly a poor-law institution, has been equipped as an emergency hospital for use should accommodation at the local isolation hospital and Anderson Sanatorium prove insufficient.

MEDICAL NEWS

University of Oxford

Dr. Margaret Jennings has been reappointed Schorstein research fellow.

University of Cambridge

On May 13th the following degrees were conferred :—

M.D.—T. O. Garland, G. H. Jennings, and W. F. Nicholson.
M.B., B.Chir.—J. H. Ward.

University of London

On June 7th and 9th at 5 P.M. Dr. B. P. Babkin, research professor of physiology in McGill University, Montreal, will lecture on the physiology of the digestive glands. The lectures will be held at University College, Gower-street, W.C., and will be open to students of the university and to others interested in the subject.

University of Manchester

Dr. E. N. Rowlands has been appointed assistant director of the department of clinical investigations and research, and Dr. Benjamin Portnoy has been appointed chief medical assistant in the department. Mr. H. T. Simmons has also been appointed lecturer in applied anatomy.

Royal College of Surgeons of England

At an ordinary meeting of the council held on May 12th, with Sir Cuthbert Wallace, the president, in the chair, Mr. Humphrey Nockolds was admitted to the fellowship. The president was appointed, ex officio, a member of the governing body of the British Postgraduate Medical School for one year, and Prof. John Beattie was appointed a member of the executive committee of the Imperial Cancer Research Fund.

The Blane medal for 1938 was awarded to Surgeon-Commander S. G. Rainsford for his work on the sterilisation of T.A.B.C. vaccine. The council decided to ask Prof. F. C. Mann, director of the institute of medical research of the Mayo Foundation, to deliver a special lecture in July of this year on the ætiology of peptic ulceration.

The posts of assistant medical officer (surgical) at the Hillingdon County Hospital, Uxbridge, of six general house surgeons at Osmania Hospital, Hyderabad, and of four general house surgeons at Mysore Hospital, Mysore, were recognised for the six months' surgical practice required of candidates for the final examination for the fellowship.

Diplomas of membership were granted to J. B. Atkins (Oxford and Middlesex) and D. G. Sheffield (St. Thomas's), and to the candidates mentioned in the report of the comitia of the Royal College of Physicians which appeared in our issue of May 7th, p. 1088. Diplomas in tropical medicine and hygiene were granted to the candidates whose names were also given on p. 1088.

Air-raid Precautions

A joint meeting of the Royal Sanitary Institute and the Royal Sanitary Association for Scotland will be held in the Royal Technical College, Glasgow, on Friday, May 27th, at 5.15 P.M., to discuss this subject. The discussion will be opened by Lieut. C. Fraser, chief air-raid precautions officer for Glasgow, Mr. Thomas Somers, the city engineer, and Dr. William Gunn, the senior assistant medical officer of health. On Saturday morning, May 28th, the members will inspect the arrangements for decontamination and first-aid, and afterwards they will visit Hawkhead Fever Hospital and Mearnskirk Hospital for Children.

Liverpool Psychiatric Clinic

The annual meeting of this clinic will be held at the Town Hall, Liverpool, on Tuesday, May 24th, at 4.30 P.M. The speaker will be Dr. H. Crichton-Miller.

Gresham College

Four lectures on physic will be delivered at the college, Basinghall-street, London, E.C., by Dr. V. S. Hodson on May 23rd, 24th, 25th, and 27th, at 6 P.M. He will speak on Some Killing Diseases. Admission is free to all.

Royal Appointments

Major-General W. B. Purdon, commandant of the Royal Army Medical College, has been appointed honorary surgeon to the King in succession to Major-General Osburne Ievers, who has retired.

Dr. E. C. Malden has been appointed surgeon apothecary to His Majesty's household at Windsor Castle, in succession to Sir Henry Martyn, who has resigned.

Portrait of Lord Horder

On May 11th Lord Horder was presented with a portrait of himself which is to be hung in the Great Hall of St. Bartholomew's Hospital. Speaking on behalf of the 380 subscribers, Lord Stanmore described Lord Horder's many services to the hospital and said he had added many to the number of its supporters.

Royal College of Physicians of Edinburgh

A meeting of the college was held on May 3rd, with Dr. Alexander Goodall, the president, in the chair. Dr. John McDougall (Murthly), Dr. John Michael Dewar (Edinburgh), Dr. David Cook Wilson (Anstruther), and Dr. David Murdoch Marr (Grantown-on-Spey) were introduced and took their seats as fellows of the college. The Lister fellowship was awarded to Lieut.-Colonel A. G. McKendrick. The Victoria Jubilee Cullen prize was awarded equally to Prof. L. S. P. Davidson (Aberdeen) and Prof. R. J. S. McDowall (London).

Dr. Douglas Kerr was elected the representative of the college on the General Medical Council for five years, and Sir Norman Walker was elected the representative of the college on the conjoint committee of management of the triple qualification.

Royal College of Surgeons of Edinburgh

At a recent meeting of the college, with Mr. W. J. Stuart, the president, in the chair, the following were admitted to the fellowship :—

Hugh Rose Arthur, M.B. Lond.; Frederick George Badger, M.R.C.S. Eng.; Arthur Lincoln Way Bell, M.R.C.S. Eng.; Alan Curtis, M.B. Liverp.; John David Davies, M.B. Edin.; Victor Drach, M.D. Manitoba; Narendranath Dutt, M.B. Calcutta; Thomas Elliot Elliot, M.B. Edin.; Dillwyn Evans, M.B. Wales; Botros Salab Ghobrial, M.B. Cairo; John Reynell Gibbs, M.B. Brist.; George David Harris, M.B. Adelaide; Arthur Robert Hill, M.R.C.S. Eng.; Samuel Wilberforce Liggett, M.B. Belf.; Edward Lipworth, M.B. Witw'srand; Alexander Lyall, M.B. Glasg.; John Sinclair MacVine, M.B. Lond.; Patrick Laurence O'Neill, L.R.C.P. Irel.; Eric Parry, M.B. Liverp.; Jal Cawashaw Paymaster, M.B. Bombay; Roy Bruford Peckham, M.R.C.S. Eng.; John Pollock Philp, M.B. Edin.; Frank Burns Plewes, M.D. Toronto; James Alexander Ross, M.B. Edin.; Allenson Gordon Rutter, M.B. N.Z.; Shanta Chintaman Saptarshi, M.B. Bombay; Frank Moore Scott, M.D. Toronto; Ian Donald Sutherland, M.D. Edin.; Roland Thornley, M.B. Manch.; Laban Edwin Vine, M.B. Lond.; Jack Arthur Wain, M.B. Witw'srand; Reginald Adolph Lovatt Wenger, M.R.C.S. Eng.; and Hermanus Claassens Wykerd, M.R.C.S. Eng.

C. E. A. Mason, L.D.S. R.C.S. Eng., received the higher dental diploma.

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Lectures in Comparative Medicine

At St. George's Hospital medical school, London, at 5 P.M. on Mondays from May 30th, Sir Frederick Hobday will give a course of six lectures entitled A Comparison of Diseases in Animals and Man. They will be open without fee to medical and veterinary practitioners and students.

Royal Institution of Great Britain

On May 27th, at 9 P.M., Prof. James Chadwick, F.R.S., will deliver the Friday evening discourse to members and their friends at the Institution, 21, Albemarle-street, London, W. He will speak on the cyclotron and its applications. The therapeutic possibilities of this apparatus are discussed in an annotation on p. 1174.

Broadcasts on Health

The Friday morning talks at 10.45 A.M. on the health of the school-child will be continued during June. On June 3rd a doctor will speak on nervous habits and on June 10th on rheumatism in children. It is hoped to arrange for a district nurse to give two talks on home nursing on June 17th and 24th.

Commonwealth Fund Fellowship

One of the fellowships offered by this fund to those holding appointments in government service overseas has been awarded to Dr. L. A. Hurst of the department of the interior, Government of South Africa. During his tenure of the fellowship Dr. Hurst will work at the New York State Psychiatric Institute.

Ex-Services Welfare Society

The fourth annual conference convened by this society will be held at the Grosvenor Hotel, Victoria Station, London, S.W., on Friday, July 1st, at 10 A.M., when Prof. Edward Mapother will preside. The subject for discussion will be mental sequelæ of head injuries.

Westminster Hospital

On May 12th the new building of the medical school was formally declared open by the Earl of Athlone, chancellor of the University of London. He was received on arrival by the mayor of Westminster and officially welcomed by Dr. Adolphe Abrahams, dean of the school. In his address the chancellor congratulated the authorities of the school on raising the greater part of the large sum required for construction. The benefits conferred on a hospital by its association with a medical school are, he said, threefold. First, the school enables the hospital to obtain the services of physicians and surgeons of distinction; secondly, the critical presence of medical students keeps the staff up to the mark; and thirdly, the school ensures that accurate clinical records are kept and that unceasing research is made into the causes and treatment of disease. Sir George Tiller, chairman of the appeal committee, who supported Mr. H. M. Clowes in returning thanks to the chancellor, said that £15,000 towards the cost still remained to be collected and he would not relinquish his chairmanship until that sum had been secured.

Work under the Midwives Act

Mr. Robert Bernays, M.P., parliamentary secretary to the Ministry of Health, last Monday addressed a conference and post-graduate course held by the Association of Inspectors of Midwives. He pointed out that under the Midwives Act of 1936 every mother was assured of the help of a trained midwife in her confinement. The new service was now well established. Nearly 2000 domiciliary midwives had been appointed by local authorities as their direct full-time employees; they had already attended 50,000 confinements as midwives, and nearly 12,000 confinements as maternity nurses. In addition 4500 domiciliary midwives were now employed by voluntary associations under arrangement with local authorities, and these had attended 80,000 cases as midwives and nearly 40,000 as maternity nurses. Rules of the Central Midwives Board embodying important changes in the training of midwives had recently received the approval of the Minister of Health, increased Exchequer grants were now available to assist the training of students who intended to become practising midwives, and provision had been made for every practising midwife to attend a post-certificate course once every seven years.

Medical Education in India

At the annual meeting of the Manchester Medical Society, held on May 4th, Sir Richard Needham gave an address on medical education in India, Ceylon, Singapore, and Hong-Kong. He pointed out that though the benefits of western or scientific medicine had been extended throughout India and the Crown Colonies in the East, large tracts and millions of inhabitants nevertheless depend on the aid and comfort provided by native practitioners of the ancient systems of indigenous medicine. In the development of scientific medical education two grades of practitioners—licentiates and graduates—had emerged and he wondered whether the time had come to train only one, the advanced or graduate, type. With the increase in medical schools (elementary) and colleges (graduates) the congregation of both grades of practitioners in the towns had made competition unbearable, and had thus debased ethical standards. The whole position should be reviewed by the recently established Medical Council of India. The curriculum provided by the medical colleges had been planned in a general way on the lines adopted in Great Britain and had so continued. The teaching institutions, whether schools, colleges, or hospitals, were established by the governments and in one way or other their continuance and maintenance is provided by government. Unfortunately the cost of supplying first-grade medical education, involving an ever-increasing budgetary grant from official sources, had meant delay and hampered progress. In Ceylon, Singapore, and Hong-Kong there was only the graduate grade of education, since the elementary grade had been abolished.

Medical Diary

May 23rd to May 28th

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MONDAY.

Odontology. 8 P.M. (Royal College of Surgeons, Lincoln's Inn-fields, W.C.), annual general meeting. Dr. A. J. E. Cave: Neolithic Skulls. Sir Frank Colyer: demonstration of new museum specimens.

TUESDAY.

Medicine. 8.30 P.M., annual general meeting. Dr. Dennis Embleton: Dietetic Treatment of Diabetes Mellitus with Special Reference to High Blood Pressure. Dr. J. G. Scadding: The Chronic Pneumonias. Dr. N. C. Oswald: Post-operative Pulmonary Complications.

WEDNESDAY.

Comparative Medicine. 5 P.M., annual general meeting. Dr. N. Hamilton Fairley: Immunity to Animal Parasites. Colonel J. A. Linton, Mr. U. F. Richardson, and Miss Muriel Robertson, D.Sc., will also speak.

THURSDAY.

Urology. 8.30 P.M., annual general meeting. Dr. Cuthbert Dukes and Mr. A. W. Badenoch: Lipomatosis in Calculous Disease of the Kidney and Ureter. Dr. W. P. H. Sheldon: Posterior Urethral Obstruction in Childhood.

FRIDAY.

Disease in Children. 5 P.M. (cases at 4 P.M.), annual general meeting. Dr. R. H. Bailey (introduced by Dr. W. Sheldon): (1) Dermatomyositis and Myositis Ossificans Dr. Dudley Hart (introduced by Dr. B. E. Schlesinger): (2) Thyrotoxicosis in a Child aged 6. Thyroidectomy. Dr. Donald Court: (3) Right Middle Lobe Collapse. Dr. Evelyn Starling: (4) Athetosis. Dr. N. S. Clark: (5) Bone Dystrophy.

Epidemiology and State Medicine. 8.15 P.M., annual general meeting. Dr. Alison Glover: The Incidence of Tonsillectomy in School-children.

MEDICO-LEGAL SOCIETY.

THURSDAY.—8.30 P.M. (26, Portland-place, W.), Dr. L. A. Weatherly: Debatable Medico-legal Episodes in My Days Before Yesterday.

EUGENICS SOCIETY.

TUESDAY.—5.15 P.M. (at the rooms of the Royal Society, Burlington House, Piccadilly, W.), Mr. D. V. Glass: Population Policies in Scandinavia and Elsewhere.

BRITISH PSYCHOLOGICAL SOCIETY.

Medical Section.

WEDNESDAY.—8.30 P.M. (Tavistock Clinic, Malet-place, W.C.), Miss S. Clement Brown, Dr. W. L. Neustatter, and Mrs. E. Norman: Some Problems Arising in the Adoption of Children.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.

TUESDAY and THURSDAY.—5 P.M., Prof. F. R. Fraser: The Clinical Aspects of the Transmission of the Effects of Nervous Impulses by Acetylcholine. (Croonian lectures.)

UNIVERSITY OF LONDON.

MONDAY, TUESDAY, and WEDNESDAY.—5.30 P.M. (Wellcome Institute for Medical Research, Euston-road, N.W.), Dr. J. W. Trevan: Variation in the Response of Animals to Drugs.

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BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane-road, W.
WEDNESDAY.—Noon, clinical and pathological conference (medical). 2 P.M., Mr. E. J. King, Ph.D.: Acidosis and Alkalosis. 3 P.M., clinical and pathological conference (surgical). 4.30 P.M., Prof. J. C. Drummond, D.Sc.: Practical Aspects of Modern Vitamin Research.
THURSDAY.—2.15 P.M., Dr. Duncan White: radiological demonstration. 3.30 P.M., Dr. Helena Wright: Birth Control.
FRIDAY.—2 P.M., clinical and pathological conference (obstetrics and gynæcology).
Daily, 10 A.M. to 4 P.M., medical clinics, surgical clinics and operations, obstetrical and gynæcological clinics and operations.

ST. MARY'S HOSPITAL, W.
TUESDAY.—5 P.M. (Institute of Pathology and Research), Prof. B. A. McSwiney: Afferent Fibres from the Abdominal Viscera.

NATIONAL HOSPITAL FOR DISEASES OF THE HEART, Westmoreland-street, W.
TUESDAY.—5.30 P.M., Dr. T. F. Cotton: Thyro toxic Heart Disease and its Treatment.

ST. GEORGE'S HOSPITAL, S.W.
THURSDAY.—5 P.M., Dr. Antony Feiling: neurologica demonstration.

MAIDA VALE HOSPITAL FOR NERVOUS DISEASES, W.
THURSDAY.—3 P.M., Dr. Wilfred Harris: clinical demonstration.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY.—2 P.M., Dr. Wilfred Pearson: Some Recent Therapeutic Introductions in Diseases of Children. 3 P.M., Mr. Eric Lloyd: Minor Deformities.
Out-patient clinics daily at 10 A.M. and ward visits at 2 P.M.

LONDON SCHOOL OF DERMATOLOGY, 5, Lisle-street, W.C.
MONDAY.—5 P.M., Dr. G. B. Dowling: Occupational Dermatitis.
TUESDAY.—5 P.M., Dr. H. W. Barber: Lichen Planus.
THURSDAY.—5 P.M., Dr. J. A. Drake: Dermatological Neuroses.
FRIDAY.—5 P.M., Dr. A. M. H. Gray: Scleroderma and Allied Conditions.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY to SATURDAY.—CHELSEA HOSPITAL FOR WOMEN, Arthur-street, S.W., all-day course in gynæcology.—ST. JOHN'S HOSPITAL, 5, Lisle-street, W.C., afternoon course in dermatology. (Open to non-members.)

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION.
WEDNESDAY.—4 P.M. (St. James' Hospital, Ouseley-road, S.W.), Dr. Paul Wood: The Electrocardiograph.

MANCHESTER ROYAL INFIRMARY.
FRIDAY.—4.15 P.M., Dr. P. B. Mumford: clinical demonstration.

Vacancies

For further information refer to the advertisement columns

Bexhill Hosp., Bexhill-on-Sea.—Two Hon. Consulting Physicians and Hon. Consulting Gynæcologist.
Bolton Royal Infirmary.—Asst. Res. Surg. O. and H.P., each at rate of £200. Also three H.S.'s, each £150.
Boston General Hosp.—Res. M.O., at rate of £150.
Brighton, Royal Sussex County Hosp.—H.P., £150. Also Hon. Clin. Asst. to Early Nervous Disorders.
Bristol, Winford Orthopædic and Heart Hosp.—M.O., £325.
British Empire Cancer Campaign, 11, Grosvenor-street, S.W.—Med. Sec. and Reg., £500.
Bury St. Edmunds, West Suffolk General Hosp.—H.S. and H.P., £180 and £150 respectively.
Calcutta, All India Institute of Hygiene and Public Health.—Prof. of Biochemistry, &c., Rs.1200 a month.
Central London Throat, Nose, and Ear Hosp., Gray's Inn-road, W.C.—Third Res. H.S., at rate of £75. Also Hon. Assts. in Out-patient Dept.
Charing Cross Hosp., W.C.—Asst. Obstet. Phys.
Charterhouse Rheumatism Clinic, 94, Hallam-street.—Four Hon. Clin. Assts.
Chelsea Hosp. for Women, Arthur-street, S.W.—Surgeon. Also Jun. H.S., at rate of £100.
Coventry City.—Asst. School M.O., &c., £500.
Coventry City Joint Pathological Lab.—Asst. Pathologist, £500.
Croydon County Borough.—Two Jun. Res. Asst. M.O.'s, each £300.
Croydon General Hosp.—H.P., £125.
Doncaster, St. Catherine's Certified Institution.—Res. Med. Supt., £950.
Dreadnought Hosp., Greenwich, S.E.—Receiving Room Officer, at rate of £150.
Durham County Hosp.—H.S., at rate of £150.
Evelina Hosp. for Sick Children, Southwark, S.E.—H.P., at rate of £120.
General Lying-in Hosp., York-road, S.E.—Jun. Res. M.O. and Anæsthetist, at rate of £100.
Gordon Hosp. for Rectal Diseases, Vauxhall Bridge-road, S.W.—Res. Surg. O., at rate of £150.
Halifax Royal Infirmary.—H.P., £175.
Haslemere, Surrey, Holy Cross Sanatorium.—Res. M.O., £400. Also Asst. Res. M.O., £200.
Hertford County Hosp.—H.S., at rate of £200.
Heston and Isleworth Borough.—M.O.H. and School M.O., £1000. Also Asst. M.O.H. and School M.O., £500.
Hosp. for Sick Children, Great Ormond-street, W.C.—Asst. Res. Surg. O., £100.
Huddersfield Royal Infirmary.—H.S. to Spec. Depts., at rate of £150.
Ipswich Isolation Hosp.—Asst. M.O.H., &c., £450.
Isleworth, West Middlesex County Hosp.—Asst. M.O., £400.
Kettering and District General Hosp.—H.P., £150.
Lancaster County Mental Hosp.—Visiting Radiologist, £200.
Leeds City.—Asst. M.O. for Maternity and Child Welfare, £500.
Leicester City Mental Hosp., Humberstone.—Locum Tenens Asst. M.O., 8 guineas per week.
Leicester Royal Infirmary.—Res. Radiologist, at rate of £200.
Lincoln County Hosp.—Jun. H.S., at rate of £150.
Liverpool, County Mental Hosp., Rainhill.—Locum Tenens Asst. M.O., 8 guineas per week.
Liverpool Heart Hosp.—H.P., at rate of £100.
London Chest Hosp., Victoria Park, E.—H.P., at rate of £100.
London County Council.—Asst. District M.O., £240.
London Hosp., E.—Med. First Asst. and Reg., £300.
London University, King's College.—Demonstrator in Physiology, £100 per term.
Manchester, Ancoats Hosp.—Orthopædic Registrar, £50.
Manchester Royal Children's Hosp.—Res. M.O., at rate of £150.
Manchester Royal Eye Hosp.—Out-patient M.O., £200.
Manchester Royal Infirmary.—Res. Jun. M.O. for Barnes Convalescent Hosp., at rate of £150.
Manchester, St. Mary's Hosps.—Res. Obstet. Officer, £150. Also two H.S.'s, each at rate of £50.
Manchester, Victoria Memorial Jewish Hosp., Cheetham.—Hon. Gynæcological Surgeon.
Marie Curie Hosp., 2, Fitzjohn's-avenue, N.W.—Res. M.O., £100.
Metropolitan Hosp., Kingsland-road, E.—Cas. O. and Res. Anæsthetist, at rate of £100.
National Hosp. for Diseases of the Nervous System, Queen-square, W.C.—H.P., £100.
National Temperance Hosp., Hampstead-road, N.W.—H.P., at rate of £100.
North Middlesex County Hosp., Silver-street, N.—Jun. Res. Asst. M.O., at rate of £250.
Northampton General Hosp.—Hon. Physician and Hon. Asst. Physician to Dept. of Psychological Medicine.
Nottingham City Education Committee.—Part-time Med. Psychiatrist, 3 guineas per session.
Nottingham General Dispensary.—Res. M.O., £300.
Nottingham General Hosp.—H.P., at rate of £150.
Oldham, Municipal Hosp.—Res. Asst. M.O., at rate of £200.
Oxford, Radcliffe Infirmary.—Hon. Physician and Hon. Dermatologist. Also Surg. Reg., £100.
Pembroke County War Memorial Hosp., Haverfordwest.—Res. H.S., £200.
Plymouth, Mount Gold Orthopædic and Pulmonary Tuberculosis Hosp.—Res. M.O., £300.
Princess Elizabeth of York Hosp. for Children, Shadwell, E.—Out-patient M.O., at rate of £175. Also H.P. and H.S., each at rate of £125.
Princess Louise Kensington Hosp. for Children, St. Quintin-avenue, W.—H.P., at rate of £120.
Prison Commission, Home Office, S.W.—M.O., Class II, £525.
Queen Charlotte's Maternity Hosp., Marylebone-road, N.W.—Hon. Asst. Physician.
Richmond, Surrey, Grove-road Institution.—Res. Asst. M.O., at rate of £250.
Royal Free Hosp., Gray's Inn-road, W.C.—Res. Cas. O., £150. Also In-patient Obstet. Asst. and Second H.P.
Royal London Ophthalmic Hosp., City-road, E.C.—Out-patient Officer, £100.
Royal Naval Dental Service.—Dental Officers.
Royal Naval Medical Service.—Medical Officers.
Royal Northern Hosp., Holloway.—Gynæcologist in V.D. Dept.
St. George's Hosp., S.W.—Res. Anæsthetist, at rate of £100.
St. Mary's Hosp., W.—Third Asst. Pathologist, £250. Also Anæsthetist in Dental Dept., £1 per session.
Salford City.—Asst. M.O. for V.D. Treatment Centre, £500.
Salvation Army, Mothers' Hosp., Lower Clapton-road, E.—Sen. and Jun. Res. M.O.'s, at rate of £150 and £80 respectively.
Sheffield University.—Demonstrator of Anatomy, £300.
Shrewsbury, Royal Salop Infirmary.—Res. H.S., at rate of £160.
Southampton, Royal South Hants and Southampton Hosp.—H.P., Res. Anæsthetist, two H.S.'s, and Cas. O., each at rate of £150.
Stoke-on-Trent, North Staffordshire Royal Infirmary.—H.S. (Orthopædic), at rate of £150.
Sudan Medical Service.—Vacancy, £E720.
Sunderland County Borough Mental Hosp.—Med. Supt., £1000.
Sunderland Royal Infirmary.—Cas. O. and H.S. to Ear, Nose, and Throat Dept., £120.
Uxbridge, Hillingdon County Hosp.—Res. Cas. M.O., at rate of £350.
Virginia Water, Holloway Sanatorium.—Jun. Asst. M.O., £350.
Wakefield, Clayton Hosp.—H.S., at rate of £200.
Watford and District Peace Memorial Hosp.—H.S. and H.P., each at rate of £150.
West End Hosp. for Nervous Diseases, Gloucester-gate, N.W.—Res. H.P., £125.
Western Ophthalmic Hosp., Marylebone-road, N.W.—M.O. in charge of Diabetic Clinic, 25 guineas.
Wickford, Runwell Hosp. for Nervous Diseases.—H.P., at rate of £150.
Willesden General Hosp., Harlesden-road, N.W.—Biochemist, at rate of £100. Also Hon. Clin. Assts. to Out-patient Dept.
Windsor, King Edward VII Hosp.—H.S., £120.
Woolwich and District War Memorial Hosp., Shooters Hill, S.E.—H.P., at rate of £100.
York County Hosp.—Res. Anæsthetist and Second H.S., £150.

The Chief Inspector of Factories announces a vacancy for a Certifying Factory Surgeon at Johnstone (Renfrew).

Medical Referee under the Workmen's Compensation Act, 1925, for the Wick Sheriff Court Districts (Sheriffdom of Caithness, Orkney, and Zetland). Applications should be addressed to the Private Secretary, Scottish Office, Whitehall, London, S.W.1, before June 13th.

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NOTES, COMMENTS, AND ABSTRACTS

PSYCHOLOGICAL FACTORS IN ORGANIC DISEASE

Dr. A. T. MACBETH WILSON, speaking at a meeting of the Medical Society of Individual Psychology on May 12th, defined organic disease as a stage of disease in which acute or chronic functional disturbances, either by their severity or their chronicity, had produced anatomical changes. By its effect on the capacities of the individual organic disease could in its turn produce further psychological and hence bodily disturbance. The resulting clinical picture was most easily understood by the use of a number of basic concepts. The first of these was what had been called the *dispositions* of organisms driven to satisfy certain needs. The second was the idea that the mode in which the drives of the individual were satisfied was affected by experience and that some *trace* of a past event could influence current behaviour. The process by which the interaction of dispositions and traces produced a continuous satisfaction of needs, despite changes in the environment, was usually known as adaptation. Whenever adaptation became difficult, a state of biological tension led to behaviour of a kind known as *emotional*, which was most likely to mean more primitive. It apparently occurred as inevitably in the body as it did, for example, in the social behaviour of an individual who must necessarily make a certain journey and would, if it was imperative, successively use a car, a bicycle, walking, and crawling. Physiological disturbances resulting from biological tension varied from one individual to another and seemed to depend on the individual rather than on the specific nature of the tension or emotional stress which produced it.

A concept of great value, particularly where adaptation had failed as a result of conflict, was that of the "language of the body"—the expression of emotion by alteration of physiological function. Some drive of the individual, because it conflicted with self-interests or self-respect, was banished from conscious expression and inhibited from using such body functions as were controlled by the central authority, the cerebral cortex. Such drives often continued to seek what satisfaction or expression was possible through disturbances of those visceral functions which were not controlled in this way. The situation might also be described as one of unrecognised biological tension. Asked about certain events, an individual might make two contradictory replies—one in words and one in the language of the body. The second might be the correct reply, as in some instances of blushing. What might be described as the idiom of body speech varied from one individual to another. The importance of understanding the idiom lay not in the treatment but in the prevention of disease.

Dr. Wilson illustrated his thesis by reference to his joint investigations on peptic ulcer [1] which showed that 84 per cent. of 205 patients had passed through some disturbing event in their lives just before their symptoms began and that recurrences also had followed gross disturbances. Work on ischæmic disease of the heart by Bourne, Scott, and Wittkower [2] had also shown that psychological disturbance might arise from organic disease, and produce secondary physiological disturbances affecting the symptomatology of the condition.

CASUALTIES IN TANK WARFARE

THE Spanish civil war, according to E. Lluesma-Uranga, is the first major conflict in which anti-tank guns have been used as a routine, and hence offers the first opportunity for a systematic study of the casualties to be expected among tank crews exposed to this form of attack. In the Barcelona journal *Revista de Sanidad de Guerra* (1938, 2, 106) he reports 21 cases which he has seen and treated and from which he draws certain general conclusions. The first point that emerges from this small series is that, probably owing to loss of velocity of the projectile in penetrating the wall of the tank, a large proportion of the wounds contained a foreign body; for the same reason there was little shattering in the track of the projectile. Shock was a frequent and serious complication in these cases; the author seems to imply that it was more common in tank casualties than in other war-wound cases. Closed fractures, due to impacts transmitted through the wall of the tank, were comparatively common. Burns, although there were not many of them, were the most serious injury, and apart from these the casualties among tank crews were in general decidedly less severe than the ordinary run of war casualties. Among the 21 cases there were no deaths, and only 1 requiring amputation. It is suggested that in view of the particularly high incidence of shock and the probability that psychical factors played a large part in it, special care is advisable in selecting candidates for tank corps; they should tend towards the hypothyroid rather than the hyperthyroid type. Adrenaline injection is advocated as a test of suitability; in sensitive men a psychological as well as a somatic reaction is observed and in general such men should not be selected for service in tanks.

A GERMAN JOURNAL OF RHEUMATISM

Zeitschrift für Rheumaforschung is the title of a new German journal, published by Theodor Steinkopff (Dresden and Leipzig), which has made its appearance this year under the editorship of Dr. P. Köhler of Bad Elster and Prof. R. Jürgens of Berlin. Its object is to awaken interest and effort in the fight against rheumatism by issuing reports of scientific investigations, and papers on treatment, together with abstracts of work appearing elsewhere. The German conscience is stimulated by the observation that Sweden is the only country to carry out a systematic and effective scheme for handling rheumatic patients. For this a central authority is held to be necessary, but such is lacking even in Germany, which "in respect of its organisation for matters of social importance marches in the vanguard."

Pride of place is given in their first number to a paper from Copenhagen by Dr. Knud Secher on Sanocrysin treatment of joint disease. Secher prefers sanocrysin to other gold preparations because he had experience with it earlier in the treatment of tuberculosis. He has no doubt of its efficacy in rheumatoid arthritis and "febris rheumatica," but is concerned in this paper particularly with two of its complications—namely, thrombocytopenia and erythematous rashes. As he explained in our issue of April 30th, he finds that the incidence of these untoward reactions is reduced by giving mixed vitamin supplements as a routine for all patients treated with sanocrysin. His sanocrysin dosage is 0·25 g., rising to 0·5 g., five doses being given at intervals of 4–10 days, and he regards the sedimentation-rate along with the clinical findings the best guide to the patient's progress. The other original paper in the first number of the journal is an analysis of the results of treatment of various forms of rheumatism at Dr. Köhler's sanatorium at Bad Elster. It deals with patients of the years 1933–34, followed up two to three years later, and it works out in considerable detail the percentages of those cured, improved, or not improved, and of those fit to work on finishing treatment and some time later. Unfortunately the value of an otherwise interesting communication is impaired by the way in which the data have been obtained. The number of patients treated in 1933–34 was 484. In 1936 questionnaires were sent to 437 of them, but only

[1] *Lancet*, 1937, 2, 1363.
[2] *Ibid*, p. 609.

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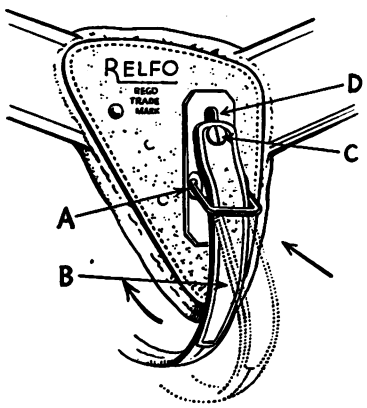
173 answered, and one cannot by any means be sure that these are a fair sample of the whole.

There follows reviews of two German books and abstracts of a dozen papers, ten of which are German.

A NEW TRUSS

THE Relfo hernia appliance has been designed by Messrs. Alexander and Fowler, Pembroke-place, Liverpool, to overcome certain defects of the elastic band type of truss. In this as a rule the understrap or perineal strap is attached to the peak of a triangular pad, or to the lower edge if it is oval or cylindrical. In both cases, particularly the latter, inward and upward pressure is lacking because the perineal strap, in passing under the perineum, must create a downward pull on the pad before exerting a very limited inward pressure.



The major points of pressure on the hips may cause abrasion of the skin and discomfort, and the inward pressure over the inguinal canal is negligible.

In the appliance illustrated the perineal strap (B) is anchored near the top of the pad. It contains a flexible, finely tempered steel spring of suitable length which passes over a fulcrum block (A). The point of anchorage and the fulcrum block are together adjustable up and down in the slot (D), so that the pressure points over the inguinal canal are variable—the lower the adjustment the lower the area of pressure. The pull on the perineal strap is almost at right angles to the perineum, and the leverage over the fulcrum block exerts a general inwards and upwards pressure to the pad and over the inguinal canal. The pressure area is easily altered by the adjustment of the screw (C) when the appliance is in position.

In double hernia the tendency towards the pads forming a V has been remedied by two adjustable cross straps, which allow also of varying distances between the inguinal canals in stout and thin subjects.

SUDDEN DEATH

Two cases of sudden death were reported by Dr. W. A. Robb at a meeting of the Devon and Exeter Medical Chirurgical Society held on April 28th, with Dr. Robert Scott, the president, in the chair.

The first patient was a fireman, aged 32, who had always seemed to be in good health. When at a fire he had occasion to move a ladder sideways while standing on one of its lower rungs—a procedure entailing considerable muscular effort. He had also been struck by the branch of a hose which had fallen on his right shoulder. Feeling none the worse he had returned home and supped; but he died suddenly soon afterwards. At autopsy the only significant lesion found was in the right chest. At the pulmonary apex there were extensive old pleural adhesions occupying an area the size of a man's hand. Between the adhesions and the chest wall behind blood had tracked along the ribs, intercostal vessels, and nerves, under the corresponding covering at the right apex, and also along the large vessels and œsophagus in the posterior part of the chest. Some had also appeared under the covering of the chest wall at the left side at the level of the 5th and 6th ribs. There was no other evidence of grave disease in the lungs or elsewhere and, in Dr. Robb's view, death was due to pleural shock.

The second case was that of a woman, aged 72, who complained of violent tearing pain in the chest and died within a few minutes. At autopsy the heart was found to be enlarged, the myocardium soft, and the mitral valve thickened. There were conspicuous degenerative changes in the coronary arteries and aorta. The pericardial sac was full of blood and clot which had leaked through a tear in the aorta about one inch from its origin. The tear had started in an atheromatous plaque whence a dissecting aneurysm had developed, probably at the time when the patient had complained of the tearing pain in the chest. The rupture of this aneurysm was the cause of death in this case.

A REGISTER OF DANGEROUS DRUGS

ONE of the tiresome minor duties of general practice is to keep the register of dangerous drugs accurate and up to date. To those who do not already use it, the small register issued by John Wright and Sons,[1] can be commended as one especially convenient for the purpose. Opening with certain essential extracts from the regulations made under the Dangerous Drugs Act, 1920, it contains pages for the entry of particulars about the use of morphia, heroin, cocaine, medicinal opium, Indian hemp, Eukodal, dicodid, and Dilaudid. The pages allotted to each poison differ in colour which should obviate all risk of errors in entry.

DIETETICS WITHOUT TEARS

WHEN housewives come to be drawn from a generation that learned the science of nutrition at school it may be possible to disseminate new views on that subject in polysyllabic scientific jargon, but in the meantime there is a need of dietetic literature written in language that the average family caterer can understand. This was the aim of Dr. Elwin Nash in his cookery book,[2] which was based on extensive research carried out in the food kitchen at Hounslow health clinic. Here, with the assistance of three expert cooks, Dr. Nash worked out a series of new recipes from first principles, using a system of investigation cards on which were set out the materials used for each dish, with their quantities, cost, vitamin content, and calorie value, the cost of fuel, the time taken in preparation, the weight of food lost in the cooking, and lastly, the report of the samplers—an unemployed man and an unemployed man's wife—and their suggestions for improvements. Cheapness was attained by using the less sought-after cuts of meat and the by-products of ordinary diet such as scrap bacon and biscuit dust; palatability was ensured by trial and error, the flavours being made intentionally strong to accord with working-class tastes. We have now received from South Africa a twenty-page pamphlet in which Dr. C. C. P. Anning, the medical officer of health for Benoni in the Transvaal, and Miss Mary Higham, an expert in domestic science, though not attempting extensive culinary details, go further in other directions. Their pamphlet, which is in both English and Afrikaans and is intended for local distribution, contains chapters on the composition of the essential foods, on digestion, and on how to ensure that a sufficiency of milk, fish, flesh and fowl, suitable carbohydrates, fruits, vegetables, and salts reaches the family dining table and is there willingly consumed. There are samples of an average week's order for a working-class family, a table of how to choose and use food, and an actual week's budget of a Benoni family of four who spent their income wisely. In the last, counting the children aged 8 and 9 as one adult, the cost of food was 10*s.* 8*d.* per head, which is about the minimum outlay for the white population in most South African towns, and of this 2*s.* 10*d.* was spent on vegetables and fruit,

[1] Register for Recording Purchases and Sales of Dangerous Drugs. Sixth edition. Bristol: John Wright and Sons. 1937. 3*s.* 6*d.*

[2] Dr. Nash's Cookery Book. Reviewed in *Lancet*, 1937, **2**, 721.

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2s. 6d. on milk (12 quarts) and cheese, 2s. 4d. on meat, fish, and eggs, and 3s. on bread and groceries. The outlay on first-class protein foods was therefore about 45 per cent. of the total. This would be an unusually high proportion in England, and the authors say that in South Africa, as in this country, most families tend to spend too much on carbohydrates.

SOCIAL REFORMS IN SWEDEN

IN 1921 the Swedish Social Board published by order of the Government a work in French on industrial legislation and social welfare in Sweden. In 1928 a new and enlarged edition of this work was published in three languages, English, French, and Swedish, and there has since been such a steady demand that it has now been revised, partly remodelled, and again republished in the same three languages. Sweden has been a pioneer in many branches of social organisation, but special interest to medicine is the information given on what has been done to combat tuberculosis, venereal disease, dental disease, cancer, mental disease, epilepsy, and blindness. Many of the reforms carried out in this sphere have encountered considerable opposition at the outset, not least because of their tentative and almost experimental character. The campaign against the venereal diseases is a case in point; at present Sweden is held up as a model to the rest of the world in this matter, but when, in 1918, legislative reforms were introduced, the outcry against them from certain quarters was remarkably shrill. Between 1919 and 1934 the incidence of syphilis has been reduced from 4630 to 1053, and of gonorrhœa from 17,772 to 12,223. These gains are not traced solely to legislation, but also to better treatment, particularly in the case of syphilis, and to certain social and economic reforms. At the end of 1935 the population of the country was 6,250,000, and in that year the increase in the population was almost negligible, chiefly because of the low birth-rate which did not exceed 13·8 per 1000, the lowest ever recorded in Sweden.

PARÉ: AN AUTHORITATIVE BIBLIOGRAPHY

A VOLUME[1] which seems likely to become the final court of appeal in questions relating to the various editions of Paré's works is illustrated with thirty photographs and engravings, chiefly of the title-pages. It examines the original separate books, the collected works, and the extracts from the works; it gives us a key to the present ownership of Paré's books; and it is provided with a full general index. Miss Doe tells us that it is modelled on Geoffrey Keynes's Bibliography of Harvey, and that it has occupied her for four years. The result is worth it. To the ordinary reader, who may not at the moment be especially concerned with the bibliographical details, the interest will lie in the notes which touch with knowledge and judgment on the facts of Paré's life, on the printers and publishers of the books, and on the history of the times. The first English translation of Paré's "Traicte de la Peste," for example, was published in 1630; Miss Doe tells us that in 1625 the plague had raged in London causing more than 35,000 deaths, and that it reappeared in 1630 but was much less fatal. From textual criticism she identifies the unnamed translator with Thomas Johnson, who was most probably the translator of the complete edition of the works issued in 1634. This Thomas Johnson was the botanist and apothecary who was famous at this period as the editor of Gerard's Herball and was a friend of many of the learned men of his time. A few years later Johnson distinguished himself as a military leader at the siege of Basing House and had a considerable influence on the determined resistance of the garrison before he died of a wound received in a sally. Miss Doe discusses at some length the identity of this Thomas Johnson and is obviously at home in the somewhat confused annals of the period. Miss Doe has the eye of an expert for bad work. One edition she stigmatises as "the most detestable of all," continuing, "There were in all twelve editions of the Oeuvres. . . . Each successive printing after 1598 is a little less good than its predecessors. All the Lyons ones, beginning with the 9th edition in 1637 are abominable: the paper is inferior: the text continues, and even adds to, the indefensible alterations: and typographical errors abound . . . the unlucky publication of Paré's writings in this 13th edition had so little success that its existence was hardly noticed." This edition was dated 1685 and from that date to their rediscovery, for it was nothing less, by Malgaigne in 1841, Paré's name and works were all but unknown. To Malgaigne the editor gives due recognition for the distinction of his profound and careful research in the history of medicine, and from one whose own work is so thorough this praise means much.

[1] A Bibliography of the Works of Ambroise Paré. By Janet Doe, Assistant Librarian of the New York Academy of Medicine. University of Chicago Press; London: Cambridge University Press. 1937. Pp. 265. 22s. 6d.

Appointments

BROWN, J. M., M.B. Glasg., Resident Medical Officer at Leicester General Hospital.

MILLER, JAMES, L.M.S.S.A., D.M.R.E., Hon. Radiologist to the Battersea General Hospital.

STUART-HARRIS, KATHLEEN, L.R.C.P. Lond., Hon. Assistant Anæsthetist to the Elizabeth Garrett Anderson Hospital.

TYRELL, T. M., M.B. Camb., F.R.C.S. Eng., Ophthalmic Surgeon for Brentford and Chiswick.

Certifying Surgeons under the Factory and Workshop Acts: Dr. J. W. C. FAIRWEATHER (Haddenham District, Cambridge); Dr. T. KIRSOPP (Fareham District, Southampton); Dr. G. I. GRIFFITHS (Bethesda District, Carnarvon).

Births, Marriages, and Deaths

BIRTHS

BROADBENT.—On May 12th, at Queen's-gardens, W., the wife of Dr. Hubert Broadbent—a son.

DANBY.—On May 15th, at the Homestead, Woodbourne-road, Edgbaston, to Victoria (née Arkell), wife of Mr. Alfred Danby, F.R.C.S.E.—a son.

EDE.—On May 12th, at Tunbridge Wells, the wife of Dr. W. O. Moore Ede—a son.

JACOBY.—On May 14th, at Nuffield House, Guy's Hospital, the wife of Dr. N. M. Jacoby—a son.

MOORE.—On May 11th, at Exmouth, the wife of Dr. David Moore—a son.

NIGHTINGALE.—On May 11th, at Barnstaple, the wife of Dr. M. P. Nightingale, of Lynton—a son.

PATRICK.—On May 14th, at a London nursing-home, the wife of Dr. H. Patrick—a daughter.

STEVENSON.—On May 11th, at Stanmore, the wife of Dr. Frederick Harwood Stevenson—a son.

MARRIAGES

BOOKLESS—LLOYD.—On May 14th, at Croydon Parish Church, Alec S. Bookless, M.R.C.S., to Elsie Daphne Lloyd, only daughter of Dr. G. W. Lloyd, of Thornton Heath.

MORRIS—FARQUHARSON.—On May 12th, at West Hackney Parish Church, London, William Ian Clinch Morris, M.B., M.C.O.G., to Mary, younger daughter of Mr. John Farquharson, Blairgowrie.

DEATHS

BOYCOTT.—On May 12th, at Ewen, Cirencester, Arthur Edwin Boycott, D.M. Oxon., LL.D. McGill, F.R.C.P. Lond., F.R.S.

FLITCROFT.—On May 14th, at Bolton, Sir Thomas Evans Flitcroft, L.R.C.P. Edin., J.P., in his 77th year.

KELLIE.—On May 10th, Colonel George Jerome Kellie, M.R.C.S. Eng., I.M.S. (retd.), of Guildford, aged 84.

KERR.—On May 10th, at a London nursing-home, Francis Ferguson Kerr, M.D. Edin., formerly of Manchester and of Winnipeg, aged 77.

LLOYD.—On May 12th, at Windsor, William Frederick Lloyd, M.B. Camb.

MASANI.—On May 12th, at Caterham, Surrey, Lieut.-Colonel Hormasji D. Masani, M.R.C.S. Eng., I.M.S. (retd.), in his 88th year.

NANCE.—On May 11th, at Bantry, Co. Cork, Surgeon Captain Sir Arthur Stanley Nance, M.R.C.S. Eng., C.B., aged 77.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

ROYAL SOCIETY OF MEDICINE.—The house and library of this society will be closed from Saturday, June 4th, to Monday, June 6th, both days inclusive.

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ADDRESSES AND ORIGINAL ARTICLES

BIOLOGICAL THOUGHT AND CHEMICAL THOUGHT

A PLEA FOR UNIFICATION *

BY SIR FREDERICK GOWLAND HOPKINS, O.M., F.R.C.P., F.R.S.

PROFESSOR OF BIOCHEMISTRY IN THE UNIVERSITY OF CAMBRIDGE

(*Concluded from p. 1160*)

I HAVE so far put before you in barest outlines a few cases illustrating at least the kind—though by no means the extent—of our knowledge concerning mechanisms without which every biological unit would be a static instead of a dynamic system, and a dead system rather than a live one. We have much more to learn concerning the precise nature of intracellular enzymes and their mode of action, but I am sure we are on the right path for reaching that knowledge, and I will again remind you that I myself belong to a generation which began with little or no understanding of such mechanisms; to one like myself the knowledge we now possess seems quite newly won and remarkable even in its present extent.

The aspect of biocatalysis which I will finally emphasise is its specificity, which, though not absolute, is a quality persistently revealed by experiment. Whatever theory of enzyme action we may hold it is sure that the primary happening is the formation of an association between catalyst and substrate, involving some definite relation between structure in or on the former and the molecular structure of the latter. It is this dominant influence of molecular structure in living systems that I now wish to illustrate further.

I remember that not many years ago a well-known biologist claimed, in a book dealing with cytology, that as protoplasm cannot be an ordinary chemical compound it can exhibit no molecular structure in the sense understood by the chemist. I used not infrequently to hear somewhat similar views expressed. The former part of the above claim is undoubtedly true. The use of the term protoplasm may be morphologically justified, but chemically it denotes an abstraction. It is sure that it is made up of parts in which the influence of molecular structure as understood by the chemist is all potent.

You will, I think, all realise that when physiologists revealed the existence and functions of hormones they not only gave increased opportunities for the activities of biochemists but in particular gave a new charter to biochemical thought, and with the discovery of vitamins that charter was extended. I would suggest also that the revelation of what we have come to know as the humoral transmission of nerve impulses is a confirmatory clause in that charter, and such, no less, is the recognition of "organiser" functions in the realm of embryology.

We have gradually come to learn the nature of a number of substances of relatively small molecular weight, not forming part of the colloidal structures of the tissue, though able to establish temporary relations with these, but existing in true aqueous solution, and so capable of transport in the aqueous phases of individual cells, or in the circulatory fluids of animals and the sap of plants. We know that the properties of each one of these—and they are surprisingly many—may make its influence absolutely essential for the normal progress and organisation of events in this or that living tissue. In their absence disorganisation follows. Characteristic of all these agents is that they function efficiently in amounts which are extraordinarily small.

HUMORAL TRANSMISSION OF NERVE IMPULSES

I will first call your attention to the phenomenon I referred to as the humoral transmission of nerve impulses. It is of exceptional interest and highly significant for my theme. The control of tissue activities by the nervous system had long seemed to involve influences quite remote from any so strictly chemical as that due to specific molecular structure. However little we knew about the precise nature of the nerve impulse itself, it seemed sure that some transmitted change largely physical in nature reached a tissue from the nerve, and there, though possibly modified in some way at the nerve-ending, directly affected the equilibrium of the tissue. To-day we know that definite chemical happenings intervene. The arrival of the nerve impulse involves the liberation in the innervated tissue of specific chemical substances, and it is to molecular properties inherent in these that the tissue directly reacts. We have gradually learnt this first from suggestions contained in pioneer studies by T. R. Elliott, followed by the brilliant researches of Otto Loewi, and now by recent and more remarkable extensions in the field due to H. H. Dale and his colleagues.

What we know to-day is briefly this: The impulses carried by nearly all the efferent neurones of the peripheral nervous system liberate in the tissues the substance acetylcholine; the exceptions being those carried by the post-ganglionic fibres of the true sympathetic system; but these liberate, alternatively, adrenaline. It is the special chemical nature of these two relatively simple substances that determines the effects observed on stimulation of peripheral nerves and constitutes a link between events in the nerve and events in the tissues.

With the discovery of these facts chemistry made an unexpected and impressive appearance in the physiological arena, and not less impressive was its entry into that of embryology when the so-called "organiser" of Speeman was discovered. It then became known that during the growth of an embryo the direct influence of a particular group of cells at the gastrula stage of development in some way induced the progress of further stages. These cells, if taken from one embryo and transferred to some locality in another, exercise their normal influence there, so that in the host certain structures are duplicated. It was striking enough when the proof came that this influence was chemical; an extract from the cells in question producing exactly the same highly specific results as the presence of the intact cells. To this story the work here in Cambridge of Drs. Waddington and Needham has contributed much.

HORMONES AND VITAMINS

I turn next to the influence of the more typical hormones and of vitamins. There is little justification for making any sharp distinction between them. In different species they have different origins, but their functions seem to be similar in essentials. I cannot

* The Linacre lecture for 1938 delivered at Cambridge on May 6th.

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of course attempt here any general discussion of their constitution or their individual functions, nor is this necessary for my purpose, though I will presently, with a particular intention, briefly indicate some relations between constitution and function in the case of a few. In the accompanying illustration I have ventured to assemble the structural formulæ of all these influential molecules so far as they are known (some dozen in all), not wishing however that the significance of structural details should trouble those who are not organic chemists but solely to make clear to the eye what for my present theme is so important—namely, the circumstance that great diversity of function goes with a corresponding diversity of structure. It should be remembered that the influence of substances, potent in function while infinitesimal in amount, is not confined to the tissues of the higher animals. Some micro-organisms at least need what may fairly be called a vitamin supply in their growth medium; hormones necessary for growth, of which the chemical nature is now known, function in plants; and some cases of similar influences have been brought to light in the economy of invertebrates, especially interesting being that of certain insects in which growth and metamorphosis are conditioned by hormones produced by a gland situate in the head (Wigglesworth). Such functions it would seem enter widely into the scheme of Nature.

To determine just how these substances exert their potent influence is an immediate task for the biochemist. It is no simple task and has only recently revealed itself as an urgent scientific duty. It has therefore not yet gone far. It is I think sure in advance that their indispensability must be due to the circumstance that like enzymes (though on different lines) they play a dominant part in maintaining the due progress of dynamic events. We have at least some direct evidence for this.

As many here will know, when a man or animal is deprived of a supply of vitamin B_1 the primary effect is disorganisation of events in the nervous system. Now during the stages involved in the normal breakdown of carbohydrate in the organism the substance pyruvic acid makes a significant appearance. Prof. Peters at Oxford has shown that the brain tissue of an animal which has suffered from a deficiency of this vitamin, unlike the healthy brain, is unable to deal normally with pyruvic acid, which therefore accumulates in the tissue. Experiments in vitro show that most minute amounts of the vitamin, acting perhaps in some essential combination, restore the power of brain tissue and other tissues which lack it, to decide the fate of pyruvic acid. This and other evidence indicates that one function of vitamin B_1 is to play an important part in the control of carbohydrate metabolism.

It has recently been revealed in dramatic fashion that the dire disease pellagra, so prevalent in certain countries, is due to the lack of a substance which has a relatively simple constitution—namely, nicotinic acid. In most minute amounts this can prevent or cure the most severe symptoms of this disease. Nicotinic acid must now be placed in the category of essential vitamins. I will here ask you to recall what I said about the functions of co-enzymes as contributing to the transference of hydrogen to oxygen. Now to the relatively complex structure of co-enzymes the structure of nicotinic acid contributes, forming that part of the whole molecule which is directly concerned in the transport of hydrogen. It would seem as though the ring structure of nicotinic acid is one which the tissues cannot synthesise, though it has important and biochemical functions to perform. It must therefore be supplied in the food. Again there is a vitamin, B_2, or lactoflavin, which is known to be necessary for animal growth. The molecule of this also contains a special ring structure—the alloxazine ring—which again the tissues seem unable to synthesise; hence the need of this vitamin. Now when in metabolism lactoflavin becomes linked up with a specific protein, it also plays, at least in certain cases, a notable part in hydrogen transport, the alloxazine ring being the essential carrier. These few cases show that the influence of vitamins may be exerted amid the dissimulative events which liberate energy; perhaps in the laboratory we have so far only found it in such connexions because it is chiefly there we have looked for it. It seems to me sure however, since a lack of any one among hormones and vitamins involves such profound and specific effects on tissue cells in the animal body, that their influence in a chemical sense goes deeper than this, and is somehow concerned with the organisation of reactions in the tissues. In some key positions they must exert a wide control over events.

I have put many facts before you, but they are a very small sample of those available with similar bearings. Many are facts of an order or kind which not so many years ago would have seemed beyond our power to reveal. What for the moment I would emphasise is that they are so frankly chemical that only chemical language can deal with them. Will any intellectual synthesis ultimately make easy a translation into biological terms? What degree of such synthesis may we hope for in the future?

STUDY OF EVENTS IN ISOLATION

I have more than once referred to "organisation." The very word gives pause to the biochemist. If his ultimate aim is to describe adequately a living system in chemical terms, he must face the fact that he is proposing to explore a field in which chemical events are organised with a complexity not thought of in the development of classical chemical science. There are doubtless "higher" levels of organisation in the description of which chemical language can take no direct part. But if we speak of higher and lower levels, we must not do so with the assumption that one is more important than another.

Description at any one level alone will be found to have inherent limitations. At the chemical level many recent studies, apart from those on micro-organisms, have been made on intact tissue cells during true survival life in vitro; but those which have thrown most light on the nature of the controlling mechanisms have involved the isolation of such mechanisms. We have isolated nevertheless not structural materials alone but events in progress, events proceeding in space and time, and therefore, as samples, retaining something at least of the nature of the whole. We realise of course that events studied in isolation may be modified when proceeding in the environment of the whole. Our methods of isolation do not, however, create artefacts, though they may lead us to study potentialities rather than actualities. It is part of our task, present and future, to distinguish the latter amid the former.

Let it be frankly admitted that biochemical studies have still before them, save in small, though not negligible, part, what I will again claim as their legitimate aim and major task—the endeavour namely to describe biochemical events from the standpoint of their organisation during life. If and when such effort succeeds, and only then, we shall

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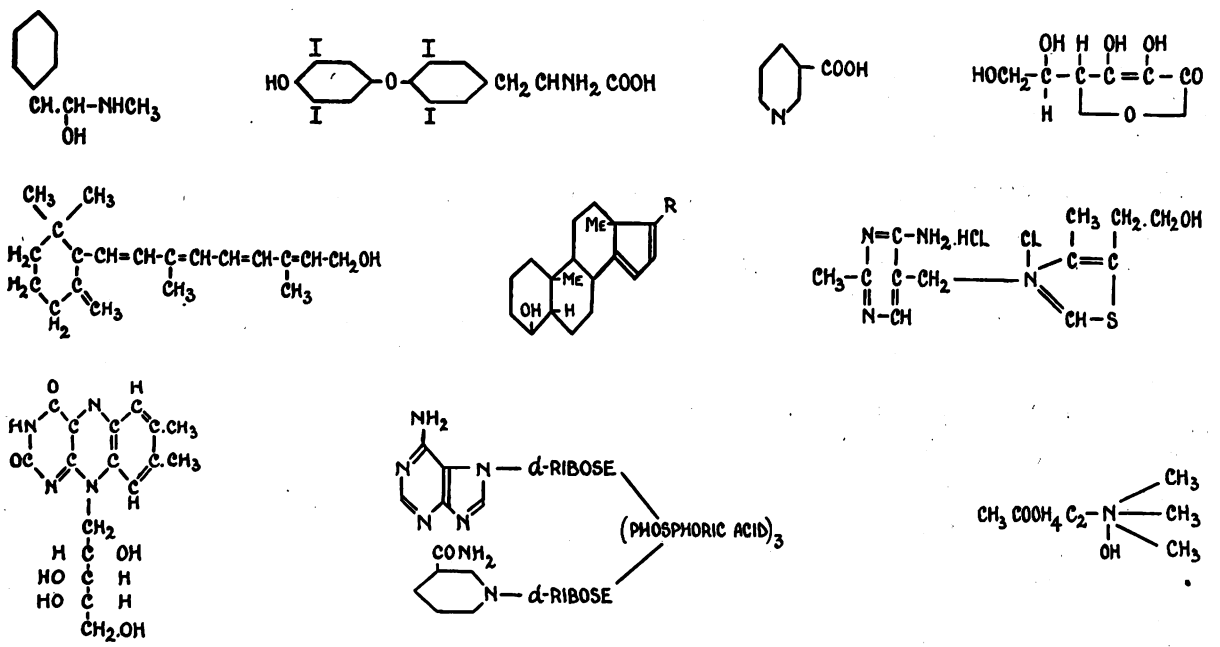
know just how far chemical thought can reach towards a full description of any living unit. Many, and, I think, most to-day, believe that the full description will call in addition for thought of another kind. Nevertheless at any one level of organisation description may have its own measure of completeness.

With regard once more to the present position of biochemistry, let me again remind you that it is only during the last few decades that its pursuits have revealed something of the nature of the individual events which must share in the organisation, and made clear how great is their number. Progress is accelerating and a young science need not fear the law of diminishing returns. Moreover as a borderland science, apart from its own momentum, it is constantly gaining impetus and fresh opportunities from advances made on each of its frontiers. Especially is this true at the present moment.

that their thought about the living cell must be mutually exclusive; may they not rather, without either losing its own special character, prove eventually helpful, and even essential each to the other?

I was a little disconcerted when asked, after the title of this lecture was announced, how I would define biological thought for my purpose, for it has many varieties. What I meant by it as applied in the particular field which I have made the special concern of this lecture, is such thought about a living unit which ignores, or minimises the importance of, those molecular events which must underlie the visible manifestations of its life; an attitude of mind often based perhaps on a doubt whether any attempt to correlate the molecular with the visible is within the competence of experimental science. Let me add that I have met the same doubt in the minds of some few highly competent chemists. Their view



Above are assembled the structural formulæ of a group of substances each of which, owing to its specific chemical nature, plays some dominant part in maintaining the integrity and due progress of dynamic events in living organisms. They are assembled not for insistence on the significance of structural details but only to make clear to the eye how great diversity of function is associated with equal diversity of constitution.

(1) Adrenaline; (2) thyroxine; (3) nicotinic acid; (4) vitamin C; (5) vitamin A; (6) calciferol, one form of vitamin D, the sterol ring system here shown is also the basic structure of the sex hormones; (7) vitamin B_1; (8) vitamin B_2; (9) co-enzyme II; (10) acetylcholine.

BIOCHEMISTRY AND BIOLOGY

I chose for this lecture an ambitious title which needs some excuse. You will have realised by now that its terms were meant to apply to a field for thought which, though surely all important and one which, occasionally at least, must occupy the mind of every biologist, is yet, for discussion, a limited one. There are of course, and always will be, great fields of biological endeavour, where no direct contacts with chemical thought are sought or called for; there are equally wide fields where chemical endeavours have no concern with biological thought. It is especially for those who feel an irresistibly strong desire to learn what can be known about the fundamental nature of living stuff, to realise that here two modes of thought make immediate contact. As Prof. James Gray has said, "cytology may rightly claim to be the frontier state in the biological commonwealth, for within its borders biologists and chemists find common ground." Are their differences such is that biochemistry should endeavour to follow every path that will lead to utility. Such paths are many and open; let us, they say, do what we know we can do and not follow a will-o'-the-wisp. I cannot agree with this view.

There are however biologists who, with none but friendly feelings for biochemical effort, and by no means excluding its results from their thoughts, yet so fully realise the complexities their own work continues to reveal that they instinctively recoil from chemical approaches that seem too facile.

There is one who, I know, sometimes feels this whose opinion all very greatly respect and value. I mean our own professor of zoology. In his admirable book on experimental cytology, to which I personally owe much, Prof. Gray, while displaying full sympathy with biochemical endeavour, to which indeed he has himself contributed, shows himself rightly concerned to warn his readers against such chemical discussions of the subject as appear to

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him crude. He will, I know, not mind my quoting some of his words. At one point, irritated perhaps by something recently read, he speaks out sharply. Having discussed some obscure aspects of cell structure he adds "but the position is dark, and placidly to regard the cell as though its mysteries were all but revealed by the magic wand of chemistry, is a sorry tribute to biological facts." And again, "A biological problem disguised by the sparkling terminology of the chemist is too often a pathetic and rather disreputable object." I would fain believe that the chemist—the would-be biochemist at any rate—has modesty enough to disclaim alike the possession of a magic wand, and the ability to speak a language which sparkles, but I quote these words of our distinguished colleague, realising that he is really much more merciful than they suggest, because they give me an excuse for suggesting that there are problems, essentially I think biological, which are disguised by any language which is not chemical.

I do not think in illustration of what I mean I need do more than repeat myself. With all the events that can be directly observed in living cells, including those truly remarkable occurrences involved in cell growth and division, cell differentiation in development, and the like, which it has been the privilege of classical cytology and especially experimental cytology to reveal, there must be associated molecular events as varied and in some way as controlled as are the visible events themselves. An understanding of these latter presents a problem which, however difficult of approach, is a real problem, and, surely, a biological problem. Only a frank disbelief in any real correlation between the invisible and the visible can remove it from that category. Yet if it is to be discussed it must be in the language of chemistry. Let me just add that there is a view sometimes expressed which I think receives a measure of approval from Prof. Gray. It claims that in cytological phenomena the influence of Form may be more important than that of Composition. If one could think only of static composition this might well be admitted, but biological components are seldom static, and dynamic changes, if they are specific, must be undergone by specific materials. In any case it seems to me that the view fails in certain ultimate issues. It is suggested for instance that the form of a chromosome rather than its chemical composition accounts for its influence. But at such magnitudes Form, as ordinarily understood, merges into molecular structure. Form holds its own, but as molecular form, the shape of molecules, and of this we have knowledge much more objective than was the case a few years ago. As I earlier mentioned, some leading cytologists are even coming to the conclusion that a chromosome is a unit structure and a complex protein molecule. I am not qualified to judge how far such a concept is justified, but if it be so it supports my general theme.

I fully sympathise with the distaste of biologists for facile chemical explanations which are a priori, and based, as Prof. Gray says, on "hypothetical biology." To read their protests is indeed a desirable discipline for the mind of the chemist. I think however that if chemists have sometimes so offended they—professed biochemists at any rate—are much less likely to do so to-day. They are at any rate, be it noted, concerned to offer descriptions rather than explanations.

Prof. Herbert Dingle in his noteworthy book "Through Science to Philosophy," referring to a certain conclusion of his own, remarks "In short, on looking forward with hope to a time when physics and biology will be safely wedded, it suggests that physics should be the proposer who, on bended knee, begs for acceptance, but it does not presume to suggest what name the happy couple should take." Under the head of physics he was doubtless thinking of physical science in general. I should like to find among my audience agreement with my own belief that biochemistry is to-day mature enough to justify such a humble proposal for matrimony, and trust you will share my hope that biology, in so far as it has been coy, will not remain so.

A SCIENTIFIC BORDERLAND

It is an old saying, abundantly justified, that where sciences meet there growth occurs. It is true moreover to say that in scientific borderlands not only are facts gathered that are often new in kind, but it is in these regions that wholly new concepts arise. It is my own faith that just as the older biology from its faithful studies of external forms provided a new concept in the doctrine of evolution, so the new biology is yet fated to furnish entirely new fundamental concepts for science, at which physics and chemistry when concerned with the non-living alone could never arrive. Whether they will prove to be such as to create an intellectual revolution comparable with that due to the development of atomic physics, who shall say? I sincerely believe that such new concepts are there to be revealed, but only perhaps as the result of new intellectual interactions. I speak, as you realise, with a special brief, but I think it is worth your while to consider whether a new line of advance in biology (not of course to the exclusion of many other lines) may not come from researches motived by a full conviction that each observed event in the complex behaviour of a living system is associated with equally complex and, surely, equally biological events at the molecular level of its constitution; and by the further conviction that both its aspects are worthy of equal intellectual concern. We must specialise in our methods, but we should share our interests.

You may ask whether I have in mind any policy which would encourage the intellectual approaches I have been advocating. It may be that they would be helped in the future by some modifications in present educational policy, but I will not enlarge on such a matter here. The main thing to hope for is the establishment of favourable mental attitudes.

In concluding my remarks I would like to take this exceptional opportunity for expressing a hope sincerely felt. As one shortly to leave the field of biochemical endeavour, I hope that my younger friends and colleagues will always justify their special designation and strive so far as is humanly possible to be biologists as well as chemists. As an ideal this is not easy of attainment, as I know well; but every effort towards it will increase the interest and the value of the work before them.

ST. GEORGE'S HOSPITAL.—Last year Mr. Harry Oakes, president of the Lake Shore Gold Mine in Ontario, gave £20,000 to this hospital and promised a further donation. He has now sent £60,000 to the hospital as the balance of his gift. Dame Marie Tempest has also sent £1000 to the fund for the ward at the hospital which is named after her. The money was collected at the Haymarket Theatre where she has been playing.

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THE CLINICAL FEATURES OF CENTRAL PAIN*

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The Pathogenesis of Central Pain †

WHAT is commonly called pain contains, as Head has insisted, two elements, (1) a true, specific sensation equivalent to touch, heat, and cold, and (2) discomfort or unpleasant feeling-tone, which may accompany many other sensations besides those which have a right to be called specifically painful. Almost any stimulus of great intensity can produce discomfort. Thus, itching is disagreeable but not painful and slowly increased local pressure is uncomfortable before it evokes pain. I have already quoted examples of preservation of discomfort with abolition of pain in spinal lesions, and these indicate that impulses which excite feeling-tone are not confined to the pathways for pain. According to Head and Thompson [32] the impulses underlying a specific sensation are already endowed with the basis of feeling-tone on entering the second sensory neurone. When discomfort is associated with pain, heat, or cold, impulses travel with those for the specific sensation in the spinothalamic tract; but when it is linked with touch or pressure the posterior column or the anterior sensory tract is the conducting path for the combined physiological change. So also with lesions of the lemniscus in the upper part of the mid-brain, as well as with lesions of the thalamus, discomfort may to some extent be preserved in spite of abolition of sensibility to pain and temperature.

Discomfort, however, is particularly linked with pain especially with grosser painful sensations, such as are evoked by massive stimulation. The pain from deep pressure, burning, or intense cold is heavily loaded with feeling-tone and the same is true of painful visceral sensations. On the other hand the pain of a prick or cut, which is more localised and bearable, and with which intensity is to some extent graded, appears to be endowed with less feeling-tone. It is the prototype of pain as a specific sensation, whilst the pain of deep pressure, muscular cramp, and visceral disease is more allied to severe discomfort.

THE CHARACTERISTIC FEATURES OF CENTRAL PAIN

As I have already said a wide variety of pains and disagreeable sensations are met with. In studying them, one is at once struck by certain features which are common to most of them at whatever level of the neuraxis the causative lesion may be. This statement requires qualification in that pains which result from electrical stimulation of the cortex and from epileptic discharge are short in duration, less severe, and less devastating than are pains from lesions at lower levels.

It is usual to differentiate between "spontaneous" and "evoked" pain, but the distinction is artificial since all sensations are the result of stimulation. Pains may be said to be "spontaneous" only in so far as the stimuli which excite them are not obvious. They are less common than pains evoked by objective stimulation because for their development the abnormal physiological and psychological factors, which are necessary for the occurrence of pathological pain, must be more favourable; the threshold requires to be lower. Excitation of peripheral receptors, somatic and visceral, is probably present in all cases, and is the main physical basis of spontaneous pain, especially when it is persistent. Many of the sources of peripheral stimulation are conjectural, but, in addition to surface contacts and varying muscular tensions, changes in visceral and vascular activities, which normally do not disturb consciousness, may well be effective in favourable abnormal circumstances. With acute and incomplete damage of sensory tracts and grey matter, it is reasonable to assume, on experimental evidence, that local excitation at the site of the lesion may be a real force and may remain so until the diseased tissues have again become stable. The evolution of the painful phenomena in concussion and minor injuries of the cervical spinal cord,[34 43] and many cases of trigeminal pain from posterior, inferior cerebellar thrombosis, especially appear to support this view. In addition, the emotional state of the individual, in so far as it affects his receptivity to pain, is obviously of prime importance.

In the majority of cases of central pain from lesions below the cortical level, spontaneous pain is constant and persistent but subject to exacerbations which may occur for no apparent reason and can be evoked by many forms of stimulation. The form and intensity of effective stimuli are influenced, as would be expected, by the presence or absence of sensory loss. In the rare cases in which there is no evident sensory impairment, even light touch, and especially gentle moving contact, is effective, whereas if tactile sensibility is diminished, more definite pressure is required. In general, painful and thermal stimuli are most potent, but often forms of stimulation, which normally do not appear to possess affective qualities, evoke pain. Light touch has just been mentioned, but active or passive movement or vibrations may sometimes cause severe pain. Further, emotional disturbances and strong excitation of special sense organs, which used to be considered to be adequate only in the thalamic syndrome, may also excite pain, although less commonly in pain syndromes from lesions at suprathalamic, brain-stem, and spinal levels; and visceral activities, such as micturition and defæcation, may also lead to exacerbations of pain. In addition, it is occasionally found in thalamic cases that stimuli, which when applied to the normal half of the body are there neutral or even pleasant, at the same time provoke pain in the affected side (synæsthesalgia), a phenomenon which Foerster [20] has used in his argument in favour of a functional relationship of each thalamus with the whole body.

In any case massive stimulation, whether in intensity or extensity, is most efficacious and, when sensory loss is severe, may alone be adequate. The combination of continuous "spontaneous" pain and analgesia in rare cases of the thalamic syndrome is difficult to explain but certainly cannot be dismissed as neurotic.

The painful sensations, however evoked, are always abnormal in that they develop explosively, are excessive, compelling, diffuse and, usually, complex and continue unduly after stimulation has ceased. These features are constant for those sensations which truly come under the painful category, but the quality of the pain varies greatly in different cases and often changes during the course of the complaint.

* The Lumleian lectures for 1938, delivered before the Royal College of Physicians of London on March 14th and 17th. The first lecture appeared in previous issues.

† Based on a paper by Riddoch and Critchley [50] read before the Réunion Neurologique Internationalle, Paris, in 1937.

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They are associated with exaggerated protective reactions, both somatic and autonomic, and especially, but by no means exclusively, in the thalamic syndrome, with great anxiety. Central pains have this in common with pains from visceral disease, causalgia, and painful phantom limbs that they possess a high degree of affectivity and for that reason tend to disorganise the patient's personality.

Sometimes pain of thalamic, bulbar, or spinal origin does diminish and, if slight, may even disappear. Such favourable results are exceptional in chronic cases but may occur during the subsidence of an acute lesion. Unfortunately, up to the present, all clinicians are in agreement on the resistance of central pain to treatment. This therapeutic gloom has, however, been somewhat diminished by the result of Frazier, Lewy, and Rowe's [22] operations on a patient who suffered from severe thalamic pain.

AUTONOMIC NERVOUS SYSTEM AND CENTRAL PAIN

Signs suggesting autonomic dysfunction may be present in the regions of the body to which pain is referred, and some of them can be related to involvement of sympathetic neural structures. Whether such coincidental disorders influence the development, severity, or character of central pain has been much discussed, especially in the French literature. The whole subject bristles with difficulties and, in the present imperfect state of our knowledge, it is impossible to arrive at a definite conclusion upon the origin of many of the vasomotor and other abnormalities and still less on their bearing upon the pathogenesis of central pain.

In the first place, it is perhaps worth restating that immobility alone can result in changes, for example in the hand, which may closely resemble the paralytic effects of autonomic dysfunction. They include cyanosis, alteration in local temperature, slight œdema, and nutritional disorders. Carmichael and his associates [55 60] have shown that alterations in temperature, colour, and sweating can be attributed to defect of autonomic innervation only when abnormalities of vasoconstrictor, vasodilator, and sweating reflexes can be demonstrated. Up to the present, they have found evidence of disorders of these reflexes in cases of paralysis and sensory loss from lesions at spinal and brain-stem levels, but not of the cortex, subcortex, and thalamus.

In any case, the changes to which I have been referring, whether due to immobility or loss of autonomic innervation, appear to be passive and, as in syringomyelia, are commonly unassociated with pain. Further, when pain is present, they do not seem to be related either to the quality of the pain or to variations in its severity.

In other cases, however, vascular abnormalities appear clinically to be of a different order, and often to vary along with fluctuation in the amount and character of the pain. Of them, redness and sweating are the most frequent, although pallor sometimes occurs. These are the cases to which Lhermitte, Bijon, and Nemours,[44] Ajuriaguerra,[1] and others have referred and which Crouzon and Christophe,[7] Alajouanine, Thurel, and Brunelli [2] have compared with causalgia. Usually they are severe examples of the thalamic syndrome, vascular lesion of the descending trigeminal nucleus, or syringomyelia. The pain then tends especially to be aggravated by a rise in the temperature of the affected part, to be soothed, when there is redness, by the local application of cold water and to have a burning quality. Here, it seems reasonable to suspect that the severity and perhaps the burning quality of the pain, as well as the peculiar distress that accompanies it, are in part due to stimuli derived from the abnormal state of the arteries. But to go so far as to conclude that such vascular impulses are transmitted by sympathetic afferent fibres in the peri-arterial plexus is unjustifiable. The balance of evidence, at present available, is in favour of transmission of sensory impulses by sympathetic afferents only from viscera, and they join the posterior root system.

COMPARISON OF LESIONS OF GREY AND WHITE MATTER IN THE GENESIS OF CENTRAL PAIN

Mme. Nicolesco [45] has draw attention to the greater frequency and persistence of pain and disagreeable sensations when central lesions, from the thalamus downwards, involve sensory grey matter rather than sensory tracts. This view is supported by clinico-pathological evidence as a whole, but especially by the large group of cases in which pain is persistent and the causative lesions appear to have become stabilised.

With pontobulbar and spinal lesions, local and remote pain may be equally severe during the active phase of the lesion; but afterwards remote pain often tends to subside whilst local pain, due to affection of sensory nucleus or posterior horns, may remain unabated. Thus, in concussion of the cervical spinal cord, agonising pain may be referred to parts at and below the level of the lesion and hyperpathia, in severe form, may be evoked. But whilst the painful phenomena in the lower limbs and trunk, as a rule, begin to diminish in a few weeks and may disappear, those in the neck and upper limbs are more protracted and often occur in cases in which remote pains are slight or absent. So also with vascular lesions of the brain-stem, for example posterior inferior cerebellar thrombosis, in the acute stage, crossed hemialgias are not uncommon. But facial pain, due to affection of the descending trigeminal root and its nucleus, is usually more persistent than is the pain in the opposite limbs and trunk, which follows involvement of the spinothalamic tract.

The more common occurrence of spontaneous pain and over-response from affections of sensory grey matter than of conducting paths is even more striking with chronic conditions, such as syringomyelia, and spinal and brain-stem tumours. Further, the relatively greater importance of disturbance of the nucleus itself is shown by lesions of the optic thalamus with which central pain is most frequently observed and in its most striking, persistent, and intractable form. This emphasis on disordered function of grey matter must be significant.

PHYSIOLOGICAL DISTURBANCES UNDERLYING CENTRAL PAIN

It is accepted that inhibition is the essential physiological process by which pain is controlled. Amongst sensations, pain and discomfort are unique in that they lead to protective reactions which tend to be urgent and compelling and to permit of little choice. So ingrained are these fundamental motor accompaniments, that they are preserved when sensibility is abolished, and even when the spinal cord is transected. In the intact individual, however, the sensory and motor responses to harmful stimulation are kept under control in the interests of discriminative behaviour. Consequently the threshold for pain is high in comparison with that for the discriminative and adaptive forms of sensation. But, at the same time, "the mechanism underlying

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the production of pain and discomfort must remain in full physiological activity, so that it can play its part in defence of the organism, whenever noxious stimuli reach a high grade of intensity." [30]

Under normal conditions, one method by which pain is kept in abeyance appears to be through the activity of the neural mechanisms concerned with those aspects of sensation which are called discriminative and it is adequate so long as pain receptors are not massively stimulated. It is well illustrated by the interaction of effects from stimulation of peripheral receptors as in Rivers and Head's experiment [51] on the glans penis. Pain which was evoked by water at 40° C. largely disappeared, and was replaced by a vivid sensation of cold when the temperature of the water was raised to 45° C.; but, as soon as the water at this temperature was brought in contact with heat spots in the corona, cold in turn gave way to a pleasant sensation of heat. When, however, the temperature of the water was brought up to 50° C. pain reappeared, the increased harmful qualities of the stimulus being now sufficient to break through the inhibition previously imposed by simultaneous stimulation of cold and heat spots.

Judged by the work of Sherrington and his collaborators, sensory inhibition is central and not peripheral, and is primarily a function of the synaptic junctions in the posterior horns of the segments which correspond to the part stimulated. Here also inhibition of impulses arising from visceral activity is imposed; and visceral pain is experienced, and the corresponding motor reactions are evoked, only when stimulation is massive enough to break through the inhibitory mechanism. In addition, control of irradiation or spread of pain is probably also primarily segmental. Cutaneous pain is more localised than pain from subcutaneous or visceral excitation because the skin is well endowed, and the deep tissues are not, with receptors for localisation which are, as a rule, stimulated simultaneously with pain end-organs when the skin is pricked or cut.

Head and Thompson,[32] long ago, insisted that the posterior horns, and their homologues in the brain-stem, are much more than simple relay stations for the passage of sensory impulses into the secondary sensory neurones. They possess integrative functions of prime importance. For, not only are sensory impulses, which underlie the same sensory quality, here grouped together irrespective of their cutaneous or deep origin, but the various streams of impulses, arriving at this junction from all receptors under stimulation, interact on one another, some being facilitated and others inhibited, partly or completely. Both excitation and inhibition are active processes, and are corresponding opposites in the Jacksonian sense. But they function in intimate partnership; in fact, except under artificial experimental conditions, the one cannot operate without the other.

Further, according to Head, it is likely that in their passage upwards to the thalamus and cortex, sensory impulses are re-subjected at each synaptic junction to the same effects of inhibition and faciliation, as additional streams of impulses from other parts come into play; and it is possible, as Creed [6] has suggested, that the transverse communications between afferent tracts may also have some functional importance in this connexion. Thus, even before they reach the optic thalamus and cerebral cortex to disturb consciousness, all sensory impulses undergo repeated modification, through the processes of integration. Under normal circumstances the points are set, from the posterior horns upwards, in favour of all those impulses which arouse discriminative sensations—touch, pressure, posture, &c.; and it is only when stimulation of pain receptors is massive enough to overcome the inhibitory processes, that pain impulses become prepotent. On the other hand, inhibition may be weakened by continued anxiety and general ill health and under these circumstances pain develops with abnormal ease.

Pain of central origin, that is from organic lesions of the sensory grey matter and tracts of the neuraxis, can be said to be the result of disintegration of the physiological processes which underlie sensory experience. The basic factor would appear to be reduction or loss of the inhibition to which potentially painful impulses are normally subjected. How is this achieved?

Following Head's theory [51] of the control of protopathic by epicritic sensibility, the first possibility is that central pain is released when the discriminative sensory elements are alone or disproportionally impaired. Foerster,[20] for example, has found that over-reaction to pain follows surgical division of the posterior columns. This effect, however, must be transient for it does not seem to be known with lesions of the posterior columns in ordinary clinical experience.

Attention has been drawn to the greater frequency of persistent pain and over-response in damage to grey matter as compared with sensory tracts; and with stationary lesions at any level, except perhaps the suprathalamic, spontaneous pain appears to develop more when the posterior horns, sensory nuclei of the brain-stem, or optic thalami are involved. It will be remembered, in this connexion, that a protopathic area from a peripheral nerve lesion, uncomplicated by causalgia or a tender end-bulb, is never spontaneously painful. From this evidence it is reasonable to assume that for long-continued spontaneous pain, and possibly also over-response to painful or uncomfortable stimuli, disturbance of function of the grey matter is necessary.

Symonds [56] has suggested, on the basis of Trotter's [59] theory of the cause of protopathic sensibility, that over-response to pain combined with a high threshold in central lesions is due to a certain limited impairment of conduction in pain fibres. Spiller [54] also adopted this view with regard to pains in syringomyelia and other diseases; and Holmes [34] considered that it might explain over-response in acute concussion and minor injuries of the cervical spinal cord. Whilst admitting that such a change in nerve-fibres may well be one of the causal factors of hyperpathia, I think that it is inadequate to explain spontaneous pain, hyperalgesia (over-response without sensory loss), and the greater frequency of central pain with lesions of the sensory grey substance. Thus, whilst upset of the integrative balance at synaptic junctions for the control of pain may result from interference with conduction in sensory paths, direct involvement of the synaptic mechanism by organic lesions seems to be of greater importance for the development of persistent spontaneous pain and over-reaction. One of the factors which may then determine the development of hyperpathia is a relatively greater blockage of impulses concerned with discriminative sensations and their associated inhibitory functions over pain impulses. In addition, under these abnormal conditions, pain receptors may be excited by stimuli, for example from peripheral circulatory changes, which are normally subliminal, but which now become effective and account for "spontaneous" pain. Faulty inhibition would also allow irradiation.

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Lastly, disorganisation of the synaptic mechanism may be one of the factors which determine the appearance of complex painful sensations, such as burning pain.

The occurrence of persistent central pain in spite of complete cutaneous analgesia might appear to invalidate the theory of control of pain at synaptic junctions by impulses of discriminative value. Attention has been drawn to cases of this kind. Head has made it clear that at the spinal level discomfort may be preserved when there is complete loss to pain from either cutaneous or deep stimulation, and, at the level of the brain-stem, discomfort, associated with crude, compelling pain may be evoked when the patient is insensitive to the pain of a prick and the threshold for deep pressure pain is much raised. Impulses which excite discomfort do not therefore travel exclusively in the spinothalamic tracts and, further, it is likely from evidence supplied by chordotomy, as well as Foerster's results from direct stimulation of sensory tracts, that the contralateral spinothalamic path, although the main, is not the sole means of transmission of pain impulses. In addition, if massive stimulation is employed, these impulses may find a way open not only in the ipsilateral spinothalamic tract but perhaps also in the posterior columns and in short relayed tracts in the grey matter, as Foerster and others have suggested.

Still the possibility of transmission of impulses underlying crude pain and discomfort, in spite of the presence of severe analgesia, does not explain the exaggerated response they may evoke, sometimes as spontaneous pain but more often as hyperpathia. The difficulty, however, may be more apparent than real when it is considered that, for example in syringomyelia, the analgesia is largely the result of destruction of the crossing sensory paths for pain in the commissure whilst the uncontrolled response excited by the pain impulses which get through is a manifestation of the disorder of integration of the synaptic mechanism in the posterior horns of spinal segments involved. Local pain in syringomyelia probably occurs only when grey matter is involved, and, provided that a sufficient number of pain impulses can find a way through the affected region, is to some extent independent of the presence or absence of analgesia.

The question that has next to be considered is whether the control of pain impulses is reinforced by specially inhibitory descending paths. Head and Holmes [31] were the first to suggest the theory of thalamic control by the cerebral cortex through corticothalamic inhibitory fibres, which terminate in the dorsal part of the lateral nucleus. In some of their cases of thalamic syndrome, there was no measurable loss of cutaneous pain on the affected side and the threshold for pressure pain was sometimes even lowered. But some form of sensory loss was present in all. Since then a number of cases of persistent spontaneous thalamic pain and over-reaction, in spite of disappearance of all forms of sensory loss, which may have been present in the acute stage, have been described. Such cases strongly support Head's view and the causative lesion probably involves the terminations of the corticothalamic fibres alone. Interruption of the same inhibitory pathways is also the most reasonable explanation of central pain which sometimes results from suprathalamic subcortical lesions. As Souques [53] and others have pointed out, the clinical picture, in such cases, may be indistinguishable from that of the thalamic syndrome. The rarity of pain of suprathalamic origin may in part be explained on Head's assumption that the inhibitory fibres arise from all parts of the cortex, although recent anatomical evidence from mammals is in favour of their derivation mainly from the parietal lobe.

Foerster has extended Head's conception and considers that the caudate nucleus and putamen also exert control over the sensory functions of the thalamus, on the ground that he has discovered over-response to painful stimulation, but without spontaneous pain, following striatal lesions. It is difficult, however, to accept the view that a sensory mechanism can be controlled by a motor.

Foerster,[20] further, postulates corticofugal pain inhibitory tracts descending into the formatio reticularis and the spinal segments. He suggests that, in the mid-brain, they are situated in the tegmentum, and, in the spinal cord, in the posterolateral columns. According to him, interruption of these tracts, in the brain-stem, may be one cause of tegmental pain and hyperpathia, and, in the spinal cord may, in certain circumstances, be the sole cause of homolateral pain and hyperpathia or hyperalgesia.

Whether it is necessary to assume the existence of special subthalamic tracts of inhibitory function is open to question. If they exist their action would be one of reinforcement to the integrative synaptic mechanism in the sensory grey matter of the brain-stem and spinal cord.

Up to the present we have been mainly concerned with diminished inhibition as the chief factor underlying the disturbed integrative balance at different functional levels and so allowing pain to appear abnormally. The possibility of pathological stimulation of grey matter and sensory fibres at the level of the lesion, as a cause of pain, remains to be considered.

Prior to the publication by Head and Holmes of their paper on Sensory Disturbances from Cerebral Lesions, irritation had been generally accepted as the chief, if not the sole, cause of abnormal pain resulting from central lesions, whether progressive or stationary. This view they condemned and it has rightly become unpopular; for, accepting the teaching of Hughlings Jackson, it is believed that a stationary lesion cannot, except by release, produce positive effects. But are active lesions entirely in the same category? It is more than probable that, especially when acute, they can by local irritation, as well as by release, give rise to pain.

Pain is normally evoked by stimulation of its peripheral end-organs, but it has long been known that abnormal excitation of sensory nerves, plexus, or posterior roots, for example by pressure, electricity, or cutting, will cause painful sensations. In recent years, moreover, evidence has been accumulating to show that the paths for pain at various points in their central course are also sensitive to stimulation. Pain has been excited by electrical stimulation of the sensory cortex [21 47] and pricking or even touching the anterolateral and posterior spinal tracts.[30] The strychnine experiments of Dusser de Barenne on the cerebral cortex, optic thalamus, and posterior horns in animals also bear on this question. It may, of course, be argued, as Penfield has suggested, that pain associated with cortical discharge, electrical or epileptic, is the result not of direct stimulation of the appropriate cells or fibres but of release of pain mechanisms in the thalamus. To say that loss of inhibition does not always play a part is impossible; but to deny that stimulation, under these circum-

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stances, is not acting as a direct exciting force is to be too one-sided. Probably both factors are in operation, but in varying degree. Pain and uncomfortable sensations developing during the active phase of acute or subacute lesions may well, in part, be the result of pathological stimulation. Either the sensory grey matter or the conducting tracts may be the seat of excitation, as in spinal concussion in which both are involved. It is impossible to say whether the cause of the lesion itself or chemical changes arising from it or local circulatory disturbances act as the stimulating agent. All, as well as other abnormalities, may be effective and the possibility of heightened excitability of the nervous elements by alteration in structure has to be taken into account.

In our preoccupation with the phenomena of central pain, and the consideration of possible explanations for its occurrence, we are apt to forget its comparative rarity, which is an equally arresting problem. It is most common with lesions of the optic thalamus but even here it is by no means invariable. Throughout the neuraxis, lesions which are comparable regionally and pathologically may give rise to similar clinical pictures, except that pain and over-response are present in some and not in others. Recent writers especially Ajuriaguerra [1] and Garçin [23] have been struck by this glaring anomaly. Many factors undoubtedly are concerned and most of them at present elude us. This, however, is clear that, as Garçin rightly says, morbid anatomy, valuable though it is, does not solve the problem. Nor is this surprising, for pain is a biological reaction of the individual as a whole, and for elucidation of its abnormal development, such factors as psychological and physical robustness to withstand pain and discomfort have to be taken into account equally with anatomical disorder of the structures which compose its mechanisms. Considered physiologically disorganisation at synaptic junctions is based on the one hand on diminished inhibition, whether due to reduced value of the discriminative sensory elements or of possible reinforcing inhibitory impulses, and on the other on massive stimulation of pain-responsive neural structures (peripheral or central). Considered psychologically, capacity to resist pain is partly inherited and is then an aspect of the constitution of the individual; and partly the outcome of education in self-discipline and adaptation to painful maladies. For example, the cyclothymic, who is born with a tendency to react emotionally, and the athlete, who has had little training in ill health, are apt to withstand pain less well than the individual who either is constitutionally gifted with more emotional control or has learned from experience to bear discomforts with fortitude.

Control or inhibition of pain and discomfort cannot be strictly labelled as psychological or physiological, for it must always act through physiological mechanisms. Excessive emotion is to perception and excessive affect is to sensation what excessive tone or spasticity is to motor activity. They all lead to maximal response at the expense of grading and adaptation.

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THE LANCET 100 YEARS AGO

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From a leading article on the desirability of an annual report on the health of the Navy.

. . . Publicity, like ventilation, purifies and gives vitality to Public Offices: in the dark, the walls throw out unhealthy damps, and lurid fungi, and acquire the fatal powers ascribed by Homer to the Circean poison, metamorphosing those who enter into all unclean animals, bats and reptiles—

Canis immundus, vel amica luto sus,

ravening wolves, and lions, all tamed, and fit only to assemble in anti-chambers, flattering the ascendant lord, like dogs, come from dinner, wagging their tails around their master. Publicity disenchants the walls; the light breaks the spell, and not only prevents office from exercising any deleterious effect on honest minds, but transmutes men already degenerated into useful public servants.

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CHEMOTHERAPY OF PNEUMOCOCCAL AND OTHER INFECTIONS

WITH 2-(*p*-AMINOBENZENESULPHONAMIDO) PYRIDINE

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EXPERIMENTAL studies with sulphanilamide (*p*-aminobenzenesulphonamide) have shown that this compound is relatively inactive against the pneumococcus, as compared with its activity against hæmolytic streptococci. The original impression given by Domagk (1935) was that Prontosil (2 : 4′ diamino-4-sulphonamidoazobenzene) had some action on pneumococcus Type III but none on Types I and II; later (1936) he found that sulphanilamide was more effective against pneumococci than was prontosil. Nitti, Bovet, and Depierre (1937) found that, in vitro, sulphanilamide had an inhibitory effect on the pneumococcus, whilst Britton (1938) noted a definite but variable bacteriostatic and bactericidal effect on Type I, Type II, and Group IV pneumococci.

In the experimental field Buttle, Gray, and Stephenson (1936) stated that "against pneumococcal (Type I) infection the drug (sulphanilamide) has little effect"; later reports by Buttle and colleagues (1937) as well as by Buttle (1937) emphasise that sulphanilamide merely delays death in mice infected with pneumococci (Types I and II). Rosenthal (1937) reported that, in mice, sulphanilamide had some activity against seven strains of pneumococcus (Types I, II, and III) but indicated that there was considerable variation in susceptibility to different strains. Cooper, Gross, and Mellon (1937) found some effect against 10 lethal doses of a highly virulent Type III coccus inoculated subcutaneously into mice. Cooper and Gross (1937a) found also some protection against the intratracheal injection of Type III pneumococcus in rats, as well as against two strains of Type II (1937b) and of Type I (Gross and Cooper 1937). Schmidt (1937) found sulphanilamide effective against 10 lethal doses of Type XIV pneumococcus. Whitby (1937) found almost no protection with sulphanilamide against 10,000 lethal doses of Type I pneumococcus (intraperitoneal).

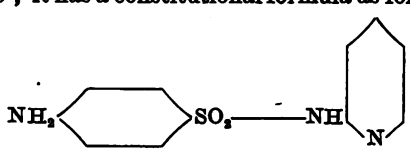
Clinical studies of pneumococcal infections in the human subject have been scanty. Most reports concern Type III infections, either of the lung (Heintzelman, Hadley, and Mellon 1937, Millett 1937) or of the meninges (Basman and Perley 1937); the last-named authors also describe a case of Type V meningitis successfully treated with sulphanilamide.

The advent of sulphanilamide gave an immense stimulus to research for chemical substances active against bacteria. The value of a large number of allied compounds has been assessed. Surveys of these have included the pneumococcus, and from time to time one or two substances have been found which have distinctly more activity against this coccus than sulphanilamide; most of such have had the disadvantage of being relatively toxic. Thus Buttle (1937) reported that the benzylidene Schiff's base of diaminodiphenylsulphone was more effective than sulphanilamide in prolonging the life of mice infected with Type I pneumococci, and half the mice infected with one lethal dose of culture survived for 30 days; the compound, however, was four times as toxic as sulphanilamide. Whitby (1937) found two diaminobenzenesulphonanilide compounds about three times more efficient than sulphanilamide for Type I infections in mice (10,000 lethal doses).

The following report deals with the activity, particularly against pneumococci, of the substance 2-(*p*-aminobenzenesulphonamido) pyridine. This is one of the many synthetic compounds kindly supplied to me by the research staff of Messrs. May and Baker; for the sake of brevity in this report, the substance will be referred to by its serial number—namely, M. & B. 693. The substance appears to protect the mouse effectively against 10,000 lethal doses of pneumococcus Type I and to afford considerable protection against 10,000 lethal doses of other types of pneumococci; it is as effective, dose for dose, as sulphanilamide against hæmolytic streptococci, and, experimentally, appears to be equally active against meningococcus; it has the great advantages of being relatively non-toxic and of being active in relatively small dose.

2-(*p*-AMINOBENZENESULPHONAMIDO) PYRIDINE

Nature.—The compound (M. & B. 693) is a white crystalline almost tasteless solid soluble in water at ordinary temperatures to the extent of approximately 1 in 1000; it has a constitutional formula as follows:—



From the formula it will be seen that the compound differs from sulphanilamide in that one hydrogen of the SO_2 NH_2 group is replaced by a basic pyridine group. The substance is also related to *p*-aminobenzenesulphonanilide, which has been reported as being active against hæmolytic streptococci (Buttle, Gray, and Stephenson 1936). An account of the synthesis of this and of a number of other compounds is in course of preparation, and will be published later.

Toxicity and effective dose.—The average lethal dose has been determined using Gaddum's (1933) method of calculating the L.D. 50. For mice the average lethal dose is 16·6 mg. per gramme; for rats

TABLE I—TYPICAL PROTOCOL

Effect of 693 on Pneumococcus Type I

Dose of drug (mg.).	Inoculum (No. of organisms).	No. of mice dying on a given day after inoculation.							Survived.	Average survival-time (days) (max. 7).
		1	2	3	4	5	6	7		
Nil.	50,000	0	6	—	—	—	—	—	0	1·0
	500	0	6	—	—	—	—	—	0	1·0
	5	0	2	3	0	0	0	0	1	2·5
5	50,000	0	1	0	2	2	0	0	1	3·7
10		0	0	0	1	1	1	1	2	5·3
20		0	0	0	0	0	1	0	5	6·7
30		0	0	0	0	0	0	0	6	7·0

15·8 mg. per gramme (Wien 1938). Doses of 1 gramme administered daily, for seven days, to cats and dogs appear to have no effect on the blood, urine, and general health. Rimington and Hemmings (1938) have shown that sulphanilamide causes an increased excretion of porphyrins in the urine and fæces of human subjects under treatment, as well as in healthy rats. M. & B. 693 administered to rats in doses of 3 mg. per g., for a period of fifteen days, causes no increase in porphyrins in the urine (Wien 1938). For experimental infections in mice the effective dose of M. & B. 693 varies from 0·25 mg. per g. to 2 mg. per g., and is therefore from 66 to 8 times smaller than the average lethal dose.

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Experimental assessment.—In all experiments described below the drugs have been given as a suspension in equal parts of water and mucilage tragacanth administered by stomach-tube. The mice used weighed approximately 20 g. The drug has been given on six occasions for each experiment: at the time of inoculation, 7 hours afterwards, and then once daily on the first, second, third, and fourth days. The amount of drug given *at each administration* is stated in the protocols; the total amount during the seven days of observation is therefore 6 times the amount stated. The number of mice in each experiment was 6. The inoculum for the test was a six-hour-old culture of the organism in O'Meara's broth, from which dilutions were made in ordinary broth so that the required inoculum was contained in 0·3 c.cm. Dilution to 10^{-9} contains approximately 5 organisms, a fact which has been controlled with each experiment by a viable count. Inoculations were made into the peritoneal cavity.

Observations were made over a period of one week and for a longer time when the question of immunity was being decided. The last column in the protocols, the average survival-time, is calculated by totalling the number of days survived by the 6 mice, and then dividing by 6, in the manner previously described by Whitby (1937). Table I shows a typical protocol, while Table II gives a summary of all the experiments, including parallel titrations with sulphanilamide.

TABLE II—SUMMARY OF ALL EXPERIMENTS
Including Parallel Titrations with Sulphanilamide (Pneumococcus Type I)

Dose of drug (mg.).	Inoculum (No. of organisms).	No. of mice.	Average survival-time (days) (max. 7).
Nil.	50,000	60	0·7
	500	60	0·9
	5	60	3·3
693— 2	50,000	6	1·5
5		30	3·2
10		42	4·6
20		60	6·5
30		48	7·0
40		24	7·0
Sulphanilamide— 2	50,000	6	1·0
5		12	1·0
10		12	1·9
20		12	3·3

For the purposes of brevity other experimental results with M. & B. 693 and various types of pneumococci are summarised in Table III below.

TABLE III—EFFECT OF 693 ON VARIOUS TYPES OF PNEUMOCOCCUS

Test organism: pneumococcus.	Lethal dose control. No drug.				Receiving dose of drug as indicated, and 50,000 organisms.		
	No. of mice with each dose.	Average survival-time with—			Dose (mg.).	No. of mice.	Average survival-time (days) (max. 7).
		50,000	500	5			
Type II.	18	0·6	0·8	2·4	10	12	4·0
					20	24	4·8
					30	12	4·5
					40	12	5·75
Type III.	30	0·4	0·5	2·4	5	18	2·1
					10	24	2·9
					20	36	3·5
					30	18	4·3
					40	18	4·7
Type V.	18	0·7	0·9	1·2	10	18	5·5
					20	18	6·5
					40	6	6·8
Type VII.	18	1·4	1·7	5·5	10	18	6·5
					20	18	7·0
					40	6	7·0
Type VIII.	12	0·6	1·2	3·4	10	12	4·25
					20	12	6·0
					40	6	7·0

Comments.—For comparative purposes the figures in Tables II and III, which provide some guide to efficiency, are the average survival-times: with a seven-day period of observation a figure of 7 indicates complete protection under the conditions of the experiment. It will be seen that M. & B. 693, in six doses of 30–40 mg., gives complete protection to mice inoculated with 10,000 lethal doses of Type I pneumococcus, and that in doses of 20–40 mg. there is complete protection against Types VII and VIII. Protection against Types II, III, and V is not complete, but is nevertheless high. Sulphanilamide used in doses up to 20 mg. (the maximum well-tolerated dose in 20 g. mice) shows a comparative efficiency figure of 3·3 for Type I pneumococcus; this represents delay in death, rather than protection.

With regard to Type III pneumococcus, parallel titrations with sulphanilamide in doses of 10 and 20 mg. gave average survival figures of 1·3 and 2·7 only.

It may be added that with Type I pneumococcus, which has been most extensively studied, observations, without further treatment, have been continued for fourteen days on 42 mice, and no late deaths have occurred. Furthermore 30 mice were reinoculated, at the end of the first week, with another 10,000 lethal doses of cocci. These animals were given no further treatment with the drug, and were found to be immune to this heavy secondary inoculation; indeed a few mice were found to be resistant to even 1,000,000 lethal doses. This immunity to pneumococcus in surviving mice has been previously observed by Buttle (1937). During the course of the experiments samples of blood and of peritoneal fluid from treated infected mice have been examined. With the experimental technique described it has been found that pneumococci multiply in the peritoneal cavity for at least four hours, but that soon after this time the organisms showed degenerative capsular changes. The capsules became swollen and crenated and eventually disappeared. Organisms were plentiful in the blood stream for periods up to 7 hours but, in 24 hours, in mice that recovered, the blood stream was almost clear.

TABLE IV—STREPTOCOCCUS HÆMOLYTICUS (RICHARDS)

Dose of drug (mg.).	Inoculum (No. of organisms).	No. of mice.	Average survival-time (days) (max. 7).
Nil.	50,000	42	0·4
	500	42	0·5
	5	42	1·7
693— 0·5	50,000	12	3·1
1·0		12	6·3
2·0		36	6·8
5·0		36	6·8
10·0		36	7·0
20·0		18	7·0
30·0		6	7·0
Sulphanilamide— 0·5	50,000	12	2·2
1·0		12	4·7
2·0		30	4·9
5·0		30	6·4
10·0		30	6·9
20·0		12	5·6

Effect on hæmolytic streptococcus.—The technique used has been the same as that described for pneumo-

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coccus. The summary of the results including parallel titrations with sulphanilamide are shown in Table IV. The results show quite clearly that M. & B. 693 is highly active in a dose as low as 1 mg. per 20 g. mouse, against 10,000 lethal doses of hæmolytic streptococci. Dose for dose, the drug appears more efficient than sulphanilamide, and, in low dose, it is very definitely superior. In this series of experiments some 30 mice have been observed for fourteen days; no delayed deaths have occurred. Surviving mice showed no immunity to a second inoculation with 10,000 lethal doses such as was found in the case of pneumococcus.

DISCUSSION

It is evident that 2-(*p*-aminobenzenesulphonamido) pyridine possesses great chemotherapeutic activity against pneumococci of several types, more especially Types I, VII, and VIII, and also gives considerable protection against Types II, III, and V.

The variation in different strains of pneumococci as found by Rosenthal (1937) is apparent also from this report. Whereas most observers have found it easier to protect against Type III than Type I, the reverse has been the case in the present series of experiments. The substance is not only highly protective against the Richards strain of hæmolytic streptococcus in mice, but is also very efficient in doses as low as 1–2 mg. per g.

No protocols concerning meningococci are included in this report, but it may be definitely stated that the substance is active against this organism. The substance appears, therefore, to have a more polyvalent action than sulphanilamide, to be effective in low dosage, and to have the great advantage, as far as can be forecast by animal experiment, of being of low toxicity; there is evidence that it does not produce porphyrinuria.

These experiments represent the one striking success in the chemotherapy of pneumococcal infections in an assessment of no less than 64 related sulphanilamide compounds, some soluble, others insoluble. It is proposed to extend the work on the particular compound here reported, and to investigate other substances similarly constituted.

SUMMARY

1. 2-(*p*-aminobenzenesulphonamido) pyridine is chemotherapeutically active in experimental infections in mice against pneumococci of Types I, II, III, V, VII, VIII and especially against Types I, VII, and VIII.

2. It apears to exert a definite action on the capsule of the pneumococcus.

3. It is as active as sulphanilamide against hæmolytic streptococcus and meningococcus.

4. It has a low toxicity for animals and does not produce porphyrinuria in those tested.

I am greatly indebted to Mr. A. J. Ewins, D.Sc., of Messrs. May & Baker Limited, for the production and preparation of the many compounds that have been assessed; to Messrs. May & Baker Limited for defraying the expenses of this work; and to my senior technician, S. R. M. Bushby, for his loyal coöperation.

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TREATMENT OF ACUTE SUPPURATIVE OTITIS MEDIA

A SIMPLIFIED METHOD SUITABLE FOR UNSKILLED HANDS

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IT is generally conceded that simple mastoidectomy should be seriously considered wherever an acute suppurative otitis media has persisted for three weeks or more. Like so many other propositions in clinical medicine, this statement must be qualified before it can be applied with any rigour. To begin with we should really say "has persisted—without definite improvement—for three weeks or more." Again we should add "and provided there is no coexisting condition, such as pneumonia or gastro-enteritis, which is adversely affecting the general body resistance." A third qualification of supreme importance is "and provided that the case has been adequately treated." This last seems so obvious as not to need mentioning, yet I have no hesitation in saying that it is a condition which is not complied with in the great majority of cases.

The treatment of acute otorrhœa in the first few weeks is almost entirely in the hands of general practitioners or public health clinics. The purpose of this article is not to disparage the work either of the practitioner or of the minor-ailment clinic, but to demonstrate how the difficulties of treatment and futility of standard instruments and techniques make such work ineffective to the last degree.

The proof of this can be seen at any time in any clinic which makes a practice of subjecting these cases to expert treatment. It is a common-place experience to see ears which have been discharging for months dry up within a few days. I do not refer here to the so-called chronic ear which may have been discharging for years, but to the case which begins with acute otitis media and drags its wearisome course for unnecessary weeks and even months. Many of these cases finally degenerate into "chronic otitis media," but even in those which eventually heal, the prolonged suppuration is only too likely to have caused serious damage. Permanent perforation of the drumhead, erosion of ossicles, and fibrosis of tympanic mucosa will predispose to further acute attacks and to progressive deafness in later life. Lastly, one cannot but suspect that mastoid operations are being performed unnecessarily on the strength of persistent suppuration when all that is required is adequate conservative treatment.

HOME CLEANSING OF THE DISCHARGING EAR

It will naturally be asked why I claim that adequate treatment is so rarely available. The

(*Continued from previous column*)

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answer is that in most cases the treatment is not even in the hands of the practitioner or clinic nurse—it is in the hands of the mother. We may lay down our proof in a few words.

1. Adequate treatment implies efficient cleansing, drying, and applications of medicaments.

2. Owing to the anatomy of the ear, this is quite beyond the power of any mother. Indeed few nurses can do it, unless specially trained, whilst general practitioners rarely have the time or opportunity.

This proof will be more convincing after we have discussed in detail the standard methods of treatment.

In the earliest stages of the otorrhœa there is a profuse discharge which is highly infectious and liable to set up a septic dermatitis of the pinna. Soon the skin of the external auditory canal and the drum become intensely inflamed, and there is always a possibility of the discharge becoming dammed back in the middle ear and attic. Clearly the aims of treatment are:—

1. To remove discharge as quickly as possible.

2. To soothe and protect the skin of the pinna and canal.

3. To diminish the congestion of the drum so that discharge cannot be dammed back by intermittent blockage of the perforation (or myringotomy incision).

There is no doubt, too, that many cases of acute otorrhœa become subacute and finally chronic, because

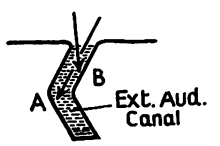

FIG. 1

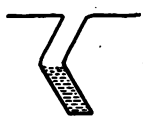
FIG. 2

of the formation of exuberant granulation tissue around the perforation. Thus is formed one type of acute aural polyp which is comparable to the exuberant granulation tissue seen occasionally in ordinary incisions and which so obstinately checks epithelialisation.

How may the ear be cleaned? (1) By dry mopping; (2) by syringing; and (3) by hydrogen peroxide.

I have put the methods in order of preference. This is no place to discuss the demerits of hydrogen peroxide. I am in complete agreement with most otologists in condemning it. The choice between syringing and dry mopping again raises the controversy between wet and dry methods. There can be no doubt that *in expert hands* the dry method is much to be preferred. On the other hand, if the patient is to be left in the fumbling care of an overanxious mother, the wet method is more suitable. The purpose of this article is to show how, by means of a quite simple instrumentarium, it is possible for the most inexpert to overcome the difficulties of the dry method. It is comparatively simple to squirt an ounce or more of saline into an ear from a soft ball syringe and even to do it aseptically. But to dry out an ear aseptically with pledgets of sterile wool is a job for an expert.

The external auditory canal is not straight, it is kinked in both horizontal and vertical planes. In Figs. 1 and 2 we see how an ear full of pus will only be half emptied by the usual method of drying it with "a little wool wound on a match stick," and in the process trauma is only too liable to occur at A or B.

The next step in the dry method is to fill the ear with powder. The expert has a powder-blower. Not so the mother. She usually ends by twisting a cone of paper and sifting in as much as she can, as in Fig. 3. The result is inevitable and pathetic in its futility: a well of pus deep in, an air-space, and finally an outside crust of powder. Nor would it be feasible to supply powder-blowers to parents. To begin with, the usual model is too expensive. In addition, apart from minor inconveniences, it has two major faults: first, it is very liable to clog up; and secondly, it can only blow in a small amount of powder, after which it blows out as much as it blows in.

Despite the manifest futility of the dry method in these circumstances, it is being taken up enthusiastically on all sides. Either finely powdered boric acid or else magnesium sulphate is prescribed. Of course, the method is by no means new. It has undergone periodic resuscitations during the past thirty years, and has relapsed into undeserved oblivion each time, for the obvious reason that the satisfactory results obtained by the expert cannot be repeated by the amateur.

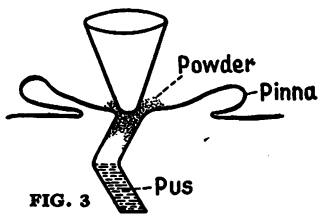

FIG. 3

Because of this the wet method of syringing the ear with a small ball syringe is still widely used. This undoubtedly clears out the pus fairly efficiently, but it keeps the ear constantly sodden. I believe that it predisposes to the formation of the above-mentioned acute aural polyp, and also that the œdematous tissues of the drum are only too likely to block the perforation. A valuable modification of this wet method is to use alcohol instead of water. This undoubtedly is a great advance, for the epithelium loses its sodden nature and the perforation is kept open. Actually it is impossible to use full-strength alcohol as it causes agonising pain. As a compromise 60–70 per cent. alcohol has been suggested, but even this is not well tolerated. The addition of a local anæsthetic such as Novocain to the solution has also been proposed, but this is clearly futile: the pain is induced immediately, whilst the anæsthetic action will take ten minutes or more to develop. This method, therefore, is very unlikely to be approved by parents, although it is worthy of consideration for hospital use.

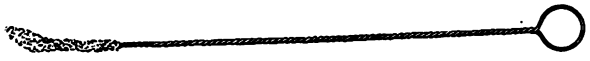
FIG. 4.—The wire wool-carrier (half natural length).

In all honesty, one must mention a farther "line of treatment" which is probably more widespread than any of the above. I refer to the method of "masterly inactivity." The doctor or otologist simply prescribes his favourite "ear drop" for repeated instillation into the affected ear, knowing full well that no possible benefit can accrue. Everyone feels that adequate treatment has been ordered, but in point of fact the magic bottle might just as well be emptied down the drain.

THE PROBLEM SOLVED

A solution of this problem is urgently required, and is in fact ridiculously simple. We need instruments which will be so simple, safe, and efficient that any mother can use them for the home application of the dry method.

We need, first, a wool carrier which will be safe and efficient even in the most amateur hands. Furthermore, it must be inexpensive. Fig. 4 shows such a carrier which I have been using for years now. It is simply a double strand of wire twisted tight,

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with a loop at one end for convenience of holding. The free ends project slightly as at P, sufficiently to hold a fine twist of wool. The advantages of this instrument are obvious. Owing to its pliability it can be pushed right down to the drum without the slightest fear of causing any damage. A dozen at a time can be capped with wool, dropped into a test-tube, and sterilised. They can be entrusted to any parent who can learn in two minutes how to dry out an ear quite efficiently.

The actual winding of the wool naturally requires a little care so as to ensure that the sharp ends do not project. This, however, is a perfectly simple matter, and amateurs can be taught in a few minutes how to do it.

What now of a powder-blower which will be cheap and efficient and safe? Fig. 5 shows a piece of glass

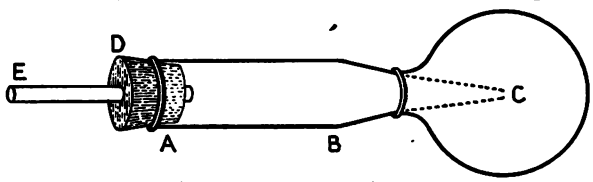

FIG. 5.—The powder-blower.

tubing AB drawn out at B so that it fits into a rubber bulb C. The end A is closed by a cork D, which is pierced by a tube E. The latter can be made of glass, but if the instrument is intended for clinic use it should be of metal, so that it can be sterilised after each case by holding it in a flame for a few seconds. This blower does not clog, and even the clumsiest mother should be able to use it efficiently.

I firmly believe that if these simple instruments could be available for the home or clinic treatment of acute otitis media, we should speedily see a most gratifying diminution in the incidence and severity of middle-ear disease.

SUMMARY

1. Widespread damage is caused by middle-ear suppuration.
2. Treatment is almost entirely in the hands of inefficient parents, or overworked clinic nurses.
3. Technical difficulties are considerable and standard instruments quite inadequate.
4. Two simple instruments are described which enable even untrained workers to give efficient home treatment.
5. It is hoped that this adequate treatment of middle-ear suppuration in the early stage will play an important part in the prevention of deafness.

These instruments can be obtained from Messrs. Servisol Ltd. (64, Myrtle-street, Liverpool, 7), to whom I am indebted for help in the final designs.

FEMORAL THROMBOSIS*

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THE only justification for the term "femoral thrombosis" must be that at present it is used to describe a well-recognised clinical condition of swelling and œdema of one or both limbs, coming on suddenly during the puerperium, in the post-operative period, or during some acute infection or other pathological process. After the acute onset the patient is left with a limb which in the majority of cases is painful and disabling, showing œdema after functional use, and which is liable to certain complications. At the same time a collateral venous circulation may develop in the superficial veins of the limb or in those of the trunk. The underlying pathological process has usually been regarded as a thrombosis of the femoral, external, or common iliac vein. Whether this thrombosis always occurs and, if it does, whether it is a primary or secondary one in the production of the clinical picture will be discussed, but for the time being the useful term "femoral thrombosis" will be used to describe a condition that appears to be a clinical entity.

The condition is often met with in medical, surgical, and obstetrical practice, yet no one, apart from the obstetrician, is likely to see any extensive series of cases. The term "white leg" is usually confined to femoral thrombosis occurring in the puerperium, but there is nothing in the clinical features of these as a group to distinguish them from the thromboses in the other pathological conditions, and there is really no reason why the term "white leg" should not be used to cover all the different groups.

Of recent years the subject of thrombosis has received a considerable amount of attention in relation to the question of post-operative thrombosis and its bearing upon the development of pulmonary emboli. On the other hand, the ultimate clinical results of these deep thromboses have not often been studied in any large series of cases.

CLINICAL MATERIAL

The 85 cases here recorded occurred consecutively either at St. Bartholomew's Hospital or in private, and form part of a series of 1300 cases referred to me for treatment on account of diseases of the arterial, venous, or lymphatic system of the limbs.

For the purposes of this paper, cases have been regarded as coming justifiably within the category of femoral thrombosis if the following criteria were satisfied:—

(1) The presence of an established cause as, for example, the puerperal or post-operative state, or the presence of some acute infection.

(2) A history of the comparatively rapid onset of pain, swelling, and heaviness of one or both limbs, involving the limb at least to the level of the knee, in many cases including the thigh and occasionally involving the lower abdomen and the gluteal region.

(3) A protracted period in bed averaging about six weeks, but in the worst cases extending to many months or even a year.

The majority of the 85 cases were not seen during the acute phase of the thrombosis. Reliance has had to be placed upon the patient's history, and, provided the three criteria set out above were satisfied, they have been included as cases of femoral thrombosis.

NATURAL HISTORY

The present paper is concerned mainly with the remote effects of femoral thrombosis and few only of the cases recorded have been under observation during the stage of onset, but for the sake of completeness a description of this stage is necessary. The onset is usually acute, with pain, swelling, and œdema of the limb. The pain varies from a dull heavy ache or dead feeling to excruciating pain, and it may involve any part of the limb or perineum. At times the onset is so severe as to suggest an arterial occlusion. Swelling usually affects the whole limb to the groin but is always worst peripherally. At times the

* Part of an essay on Phlebitis awarded the Buckston Browne prize by the Harveian Society of London.

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tension in the tissues is so great that there is no pitting on pressure. The pain and swelling take 24 to 48 hours to reach their maximum, after which they gradually begin to subside. There are extreme variations in the severity of the process, but the average case takes about six weeks for the œdema to disappear at rest, though of course it returns in the upright posture.

ÆTIOLOGY

Femoral thrombosis may occur during the course of a great variety of diseases and pathological states, particularly acute or chronic infections, in the post-operative period or in the puerperal state. In addition to these, it may be a late or terminal process in cachectic conditions. In the group of cases now under consideration, thrombosis, phlebitis, and lymphangitis may all play a part. Infection may be responsible for initiating the process, but the development of an infective thrombophlebitis with suppuration does not occur.

From the Table it will be seen that the largest group was a manifestation of the puerperium, the second largest was post-operative, and the third typhoid. One of the outstanding features is the preponderance of left-sided thromboses. In the unilateral cases the left side was affected approximately 2½ times as often as the right. This suggests that anatomical factors play some part in the process.

TABLE SHOWING CAUSES, SEX, AND SIDE INCIDENCE

Causes.	Total and per cent.	M.	F.	R.	L.	Both sides.
White leg	39 (45·9)	..	39	9	18	12
Post-operative ..	17 (20·0)	4	13	5	7	5
Typhoid	12 (14·1)	7	5	1	10	1
Pneumonia and broncho-pneumonia	6 (7·0)	4	2	1	5	..
Pleurisy	1 (1·2)	1	..	..	1	..
Influenza	2 (2·3)	..	2	..	1	1
Phlebitis	5 (5·9)	1	4	2	1	2
Fracture	1 (1·2)	1	..	..	1	..
Ulcerative colitis ..	1 (1·2)	..	1	..	1	..
Erysipelas	1 (1·2)	..	1	..	1	..
Totals	85	18	67	18	46	21

M. and F. = male and female; R. and L. = right and left.

RESULTS OF THROMBOSIS

With the immediate prognosis at the time of the acute onset of the thrombosis I am not here concerned, but it may be pointed out that deaths from pulmonary emboli are much less likely in "manifest" than in "occult" thrombosis. It may be that the outward and visible signs of femoral thrombosis mean the presence of something more than a lightly adherent thrombus in the vein.

The following were the main symptoms complained of by patients:—

Discomfort and pain: Numbness, aching, severe pain, heaviness either constantly or after exercise, cramps, tenderness, stiffness.

Swelling and œdema: Persistent swelling, swelling in the evenings or after exercise.

Development of varicosities: Varicose veins in the limb, varicose veins in the trunk.

Changes in the skin and subcutaneous tissues: Dermatitis, recurrent ulceration, recurrent phlebitis, periphlebitis, and scleroderma.

Typically, the patient is left with a functionally damaged limb which is a constant source of discomfort, disability, and anxiety. After a night's rest the limb is approximately normal but œdema develops with activity and is usually considerable by the early evening. In others some degree of œdema is always present; these patients have constantly to nurse the limb. Moderate activity is possible, but prolonged walking or standing is extremely painful and the majority have seriously to limit their activities. In the absence of complications, many show a gradual tendency towards recovery.

A second group includes cases with complications—varicose veins, phlebitis, dermatitis, ulceration, pigmentation, periostitis, &c. These patients are only too conscious of the ever-present burden of the damaged limb which is functionally of little value and causes inconvenience, discomfort, and pain. Once complications have occurred, persistence of symptoms is almost inevitable unless early and energetic measures are taken. Minor trauma is often fraught with far-reaching consequences and slight abrasions or infections are only too often the starting-points of prolonged ulceration.

PHYSICAL SIGNS

The cases may be analysed into four groups:—

(1) The physical signs suggested that the underlying pathological process was confined to some obstruction of a deep vein which mainly gave rise to a compensatory dilatation of superficial veins.

(2) Œdema was the characteristic feature but there was no evidence of any abdominal collateral circulation.

(3) A collateral abdominal circulation and the presence of œdema suggested obstruction to deep veins and obstruction to the lymphatic return of the limb.

(4) The physical signs indicated a complete return to normality of the limb, but no case of this type is recorded in the present series.

The 85 cases were divided into these groups as follows:—

Pure thrombosis	2
Pure lymphangitis	61
Thrombosis and lymphangitis	22
Complete recovery	0
Total	85

In considering the question of a collateral circulation, attention has been confined to abdominal vessels. Sometimes dilatation and varicosity of the saphenous tract develops subsequent to deep thrombosis but without evidence of any abdominal collateral circulation. These cases form a small group and have not been especially analysed owing to the fact that many patients had existing varicose veins at the time of the deep thrombosis, and others again were not quite certain of the chronological relationship between the deep thrombosis and the development of saphenous dilatation. On the other hand, the objective manifestations of abdominal varicosities are easily made out on physical examination.

In the first of the 2 cases of pure thrombosis typhoid was the cause, and the limb was half as large as its fellow with total dilatation of the saphenous vein but there was no œdema; in addition, there were three very large veins from the saphenous opening passing over the lower abdomen. In the second case, the thrombosis followed a miscarriage; there was no œdema, but from the region of the groin huge veins passed up to the level of the nipples. It is probable that the figure of 61 for the "pure lymphangitis" group over-estimates the number of cases of pure lymphatic obstruction for the reason

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given above in connexion with the collateral circulation. The degree of œdema naturally varies from patient to patient. In the mildest the limb is entirely normal in the morning and it is only at the end of the day that slight œdema over the anterior border of the shin can be made out. In other cases the œdema develops after a few hours' exercise and becomes very severe during the afternoon. In a further group the limb is always considerably larger than its fellow and anything more than moderate function is impossible. In general, the disability is proportionate to the œdema. In the 22 cases with evidence both of thrombosis and of lymphatic obstruction there was an abdominal collateral circulation together with some degree or other of œdema of the limb. In no case in the series did the limb return completely to normal. Had such complete recovery occurred, then it would almost certainly have been met with in the 1300 cases from which the deep thrombotic ones were selected.

Collateral circulation.—The term "collateral circulation" has been used here only in relation to abdominal varicosities. That involving the saphenous vein has been excluded for the reasons already given.

In 22 of the 85 patients there was evidence of an abdominal collateral circulation. In 2 the condition was apparently one of pure thrombosis, and in the remaining 20 cases it was associated with some degree or other of lymphatic obstruction. The extent of the collateral circulation varied considerably in the different cases:—

Pubic or hypogastric	9
Lower abdominal	5
Pubic and lower abdominal	3
To nipples	3
Iliac crest	1
Perineum and lower abdominal	1
Total	22

The pubic or hypogastric group was the largest, the veins in these cases being dilatations of superficial external pudic vessels, which anastomose with corresponding vessels on the opposite side. At the same time, where varicosity is well marked, the anastomoses may lead to a secondary dilatation and varicosity of the internal saphenous vein on the opposite side. The lower abdominal group is next in importance and represents dilatation and varicosity of the superficial epigastric vein, while under "pubic and lower abdominal" is included cases that combine the two previous groups. In 3 cases there were extensive varicosities reaching to the level of the nipples and anastomosis was effected with intercostal veins. In some of these, vessels were also present passing up to the axilla.

There was no evidence in these 22 cases to suggest that the compensatory circulation in any way affected the degree and persistence of œdema of the limb. The abdominal collateral circulation caused embarrassment to a few patients. Some were conscious of a dull ache: one had quite severe discomfort associated with very large thin-walled veins protruding through the skin; in another the hypogastric circulation was the site of recurrent phlebitis; whilst in other cases the varicosity of the sound limb was the cause of symptoms.

Ulceration.—At some time or other in 26 of the 85 patients—30·6 per cent. or approximately one in every three—there was the added complication of subsequent ulceration. The main features of the ulceration occurring in deep thrombosis are well known. It occurs most often in the lower half of the leg on the inner side, and frequently follows some minute injury or abrasion. On account of the serious circulatory defects in the limb, chronicity is the rule. With time the tissues surrounding the ulcer become thickened, hard, and indurated, and the ulcers themselves are frequently deep, dirty, and indolent. Extensive inflammatory changes may take place in the adjacent subcutaneous tissues. In many cases this inflammatory reaction is so severe as to involve the periosteum of the leg bones, and the linear extent of this periostitis is often surprising. From the point of view of ætiology, these ulcers are best regarded as lymphatic and gravitational in origin, and from the point of view of therapy they form a much more intractable group as a whole than ordinary varicose ulcers. In 8 patients the ulceration had been present either continuously or in a recurrent form for over 15 years; in another for 36 years.

Phlebitis.—Attacks of phlebitis were present in 9 cases (10·6 per cent.) either as single attacks or in the form of recurrent attacks. The phlebitis involved superficial varicose veins and in no way differed from the phlebitis occurring in idiopathic varicosities, with the possible exception that in cases with considerable œdema periphlebitis was more likely to occur.

Post-operative group.—The deep thrombosis was a post-operative complication in 17 patients. The antecedent operations are as follows:—

Operation.	*Cases.*
Appendicectomy	6
Hysterectomy (one with appendicectomy)	3
Fibroids	1
Ovariotomy	2
Cholecystectomy	1
Gastro-enterostomy and appendicectomy	1
Inguinal hernia	1
Breast abscess	1
Varicose vein excision	1
Total	17

It will be seen that the two largest groups are those associated with appendicectomy and with operations on the female genital tract. The operation involved the peritoneal cavity in all but 2 cases.

TREATMENT

The treatment of femoral thrombosis may be considered in relation to the acute, the transition, and the remote periods.

Acute period.—Treatment must be largely governed by two considerations, the risk of pulmonary emboli and the painful and disabling nature of the condition. It has become conventional to keep these patients in bed for a period of at least six weeks, almost irrespective of the degree of severity of the lesion. As has already been pointed out, pulmonary emboli are much more likely with latent than with manifest thrombosis, and the risk of this complication will have passed by about the end of the second week. During this phase the patient must be in bed with the limb completely immobilised and encased in wool. At the onset the pain may be extremely severe and sometimes calls for morphia. After this initial period the limb should be elevated above the level of the rest of the body as this will do more than anything else to diminish the lymphatic œdema. The length of this initial period in bed must be determined by the severity of the œdema. In the slighter cases very little œdema may be present at the end of a month. In severe cases the limb may be grossly œdematous three months or more after the thrombosis. If œdema is present at rest it is quite certain that it will be aggravated by any attempt at activity.

Transition period.—Between the acute phase and the time when the limb obtains some degree of circulatory stability, treatment must be designed to prevent the development of anything like pronounced œdema. The more there is œdema as a result of overactivity of the limb, the more will the lymphatic spaces become dilated and, in consequence of this, the more readily will the limb tend to become œdematous. Treatment must consist in controlling

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this tendency, by permitting exercise that stops short of producing œdema. Local control can be obtained by the various forms of external support, such as Elastoplast. If these supports are used, they should be applied when the limb is not œdematous. Without external support much greater modification of activity is necessary to avoid œdema. Superficial massage and sinusoidal surging current baths may be of value.

Remote period.—The circulatory condition of the limb becomes almost stabilised and adapted to the new conditions after the strains imposed upon it during the acute phase. Depending upon the severity of the initial condition, this period may be reached in anything from six to twelve months. By this time the patient should have passed out of the acute phase and should have become aware of the approximate functional capacity of the limb. Whatever therapeutic measures are employed, it is certain that the majority of these patients have to adapt themselves and their lives to the local circulatory failure of these damaged limbs. The nature of that adaptation will depend primarily upon the degree of residual œdema. It may mean that certain occupations that involve standing or walking are quite precluded; or it may mean a period of recumbency during the middle of the day, or only rest after the day's work. Control of the œdema will involve the continued use of elastic strapping in the most severe cases, and by this means patients who were formerly complete cripples may be enabled to walk. In the less severe cases œdema may be controlled by the use of surgical stockings. Many patients, however, are completely intolerant of any form of external support, and in these improvement both real and symptomatic may be obtained by the use of massage and sinusoidal baths for periods of about a month, two or three times a year. In this way, limbs which are painful and weak may be rendered much more useful through the diminution of pain and œdema and the improvement in muscular tone. Radiant heat should not be employed in the treatment of these patients. Limbs that have been the site of deep thrombosis appear to have a diminished sensibility to pain; they are apparently much more easily burned than are normal limbs, and the burns are very intractable.

Varicosities.—It was formerly my practice to consider the treatment of any secondary varicosity that developed in these limbs as being strongly contra-indicated on account of the fact that the superficial dilatation was compensatory. Sometimes, however, this becomes an over-compensation, and superficial veins that were taking on the work of obstructed deep veins may lose their efficiency as the result of secondary incompetence of the valves. The real problem in these limbs is not connected with the presence of varicosities, since it is the œdema that is invariably the main cause of symptoms. It is important therefore to decide how far varicosities are the cause of symptoms. If œdema is slight and varicosities are prominent, then treatment by means of operation or injections may diminish symptoms and render the limb more comfortable, but if œdema is marked, then the treatment of varicosities is not likely to effect any serious improvement in the functional capacity of the limb. At the same time, the use of injections under these circumstances may often provoke quite a sharp reaction in the veins, together with periphlebitis. If treatment is carried out it should only be after a full consideration of all the facts, and injections should be carried out at infrequent intervals. Only in a few instances do abdominal collateral veins cause symptoms or reach a size sufficient to demand treatment. When these veins cause serious local discomfort there is usually no danger in obliterating them therapeutically by operation or by injection. Similar measures may be necessary in cases where abdominal veins have reached a large size or have become exceptionally thin-walled. When the collateral circulation has secondarily involved the superficial veins of the sound limb, there is no serious objection to treatment of these veins if indicated.

Ulceration.—The main features of ulceration in deep thrombosis have been described. Treatment of this group of cases is not as satisfactory as that of ulceration secondary to idiopathic varicose veins. In the latter group the obliteration of the varicosities is followed by healing of the ulceration. In ulceration associated with deep thrombosis, the ulcerative process is secondary to lymphatic obstruction, an obstruction which is not amenable to treatment. Varicosities may also be present in these cases, but the cure of these is not so readily followed by the cure of the ulcers. At the same time the chronicity of these ulcers often leads to the development of periostitis of the adjacent bones, a change which in itself tends to persistence of ulceration. Skiagrams should be carried out in all cases to determine the extent of any bone involvement. Ulceration cannot be expected to clear up in limbs which are constantly œdematous. Whatever treatment is carried out, it must involve the rendering of the limb free from œdema. This result may be achieved by a long period of recumbency, or by persistence in the use of elastoplast, &c. Both of these methods may in time achieve healing of these very intractable ulcers. In cases where varicosities are present in close relation to the ulceration, treatment by means of operation or injection should be carried out in conjunction with the foregoing measures designed to diminish œdema.

INCIDENCE

How common is femoral thrombosis? From the available data it is almost impossible to get accurate statistics, but it is certain that the main incidence of the disease occurs in the puerperal and post-operative types.

In the puerperal type, the incidence of deep thrombosis is variously given as from 0·21 per cent. (Nettelblad 1931) to 0·91 per cent. (Seitz). Taking 0·5 per cent. as an average incidence and the number of births in England and Wales, 1936, as 605,292, this gives a total of 3026 cases for the year.

The incidence of femoral thrombosis in the post-operative group varies from 1·2 per cent. for abdominal operations (Clark 1903) to 2·19 per cent. for gynæcological operations (Schmidt 1931). There are no data available as to the total number of major operations performed in England and Wales in the course of a year. Assuming a very conservative number of 100,000 and taking the incidence of femoral thrombosis as 1·5 per cent., then this gives a total of 1500 cases per annum.

It is impossible to get any exact data for the other groups of cases. Taking all these sources together upon a very conservative basis, some 5000 cases of femoral thrombosis must occur annually.

ÆTIOLOGY

The results of the present investigation show that circulatory recovery is never complete after so-called deep femoral thrombosis. It has been suggested that this condition is associated in some cases with mere thrombosis, in others with a lymphatic obstruction, and in others again with a combination of thrombosis and lymphatic obstruction. In explanation of the pathology of femoral thrombosis, the following factors have to be considered:—

Venous.—It has generally been accepted that the deep veins are obstructed and that this is responsible for the sequelæ in these cases: but there is very considerable evidence on clinical and experimental grounds against the view that obstruction of a deep vein can ever be responsible for persisting œdema.

Arterial.—There is nothing to suggest that arterial damage plays any part in the production of deep thrombosis. On the other hand, some cases are associated with arterial occlusion and even gangrene of the limb. It is believed that the inflammatory

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process, beginning outside the vein and leading to its thrombosis, also spreads through the wall of the artery and is followed by arterial occlusion, which is, however, quite unusual, and there is nothing in the evidence to suggest that it plays any part in the results now under discussion. The alternative view is that the arterial changes are due to spasm.

Lymphatic.—It seems almost certain that it is lymphatic occlusion that is responsible for the persisting œdema characteristic of practically all cases. This œdema is a characteristic feature of the period of onset, and also of the remote period. Its degree and extent show considerable variation, depending upon the severity of the obstruction. During the acute phase the whole of the lower limb is characteristically involved below the level of Poupart's ligament, and in some cases œdema can also be made out over the lower abdominal wall and the gluteal region. The extent of the œdema therefore corresponds approximately to the lymphatic drainage area of the lower limb, but there is nothing in the clinical evidence to suggest that an inguinal lymphadenitis is responsible for the result. In the remote stage the extent of the œdema shows extremely wide variations, in the mildest being present merely over the lower part of the shin after exercise, whilst in the most severe cases the whole limb is persistently œdematous and larger than its fellow.

Infectious.—If infection plays any part in leading to deep thrombosis, then the evidence suggests that it is mild and non-suppurative.

Composite.—The evidence here put forward suggests that in about a quarter of the cases the lymphatic obstruction has been associated with venous obstruction, as shown by evidence of the subsequent development of an abdominal collateral circulation. In view of the definition which has been given to the term collateral circulation, it may be that this phenomenon is possibly present in a larger group of cases than suggested in these figures. If such is actually the case, then the obstruction of the veins must be below the level of the saphenous opening.

Nervous.—In view of what has been said regarding the primary site of the pathological change in the perivenous tissues in these cases, it might well be that the inflammatory change involves the arterial sympathetic plexus. Nothing, however, in the subsequent history of these patients suggests that the sympathetic nervous system in the limb has been involved. Lériche (1931), on the other hand, has advocated peri-arterial sympathectomy for the condition.

* * * * * *

Considering the length of time which phlegmasia alba dolens has been known and described, it is surprising that so little is still understood about its morbid anatomy. Homans (1932) records two interesting cases relating to this aspect:

The first patient was a negro with a severe degree of "white leg" complicating pneumonia. An exploratory operation was carried out and the tissues around the left iliac vessels were grossly œdematous and "porky." The vessels themselves were found with difficulty. Arterial pulsation was present and the interior of the vein was filled with dark clean clot. A dramatic result followed this operation. On the following day the patient felt the tension lessen decidedly, and in three days the swelling had gone down remarkably. A second operation was carried out later on and the femoral sheath opened in Hunter's canal. In the second case recorded by the same writer, the sheath of the iliac vessels was converted into a nearly solid scar which involved both artery and vein.

There is nothing in the clinical evidence to suggest that ligature of the common or external iliac veins or the common femoral vein is followed by persisting œdema of the limb. Ligature of the main deep vein is followed by slight swelling of the limb with cyanosis, both of which changes clear up during the course of a week or so, but may be followed by the development of a collateral circulation. Persistent œdema is not a result of this operation.

The cases that have been described under the heading of "primary thrombosis of the axillary vein" may also shed some light on the subject. Axillary thrombosis, though at the time of onset there may be associated œdema and cyanosis of the limb, is not followed by persistent œdema. A collateral circulation may develop, the functional condition of the limb is usually perfect, and œdema is not a feature. This primary axillary thrombosis is in most cases traumatic; there is nothing in the pathology of these cases to suggest an inflammatory or lymphatic origin.

In a normal limb, arterial, venous, and lymphatic elements are essential to the preservation of the normal circulatory balance. Venous obstruction may be followed by a temporary swelling and œdema of the limb, but this does not persist. Lymphatic obstruction, on the other hand, is associated with some degree or other of permanent œdema. This œdema may follow cellulitis of the subcutaneous tissues, in which case the damaged lymphatics are the peripheral ones; it may follow inguinal adenitis of pyogenic, tuberculous, or other chronic type; or it may be associated with true elephantiasis of filarial origin.

Anatomically, the main and the largest lymphatic channels of the limb run in the deeper parts of the subcutaneous tissues immediately superficial to the deep fascia. It is doubtful, in the light of more recent evidence, whether there are beneath the deep fascia deeper lymphatic channels of any comparable size. These large superficial lymphatic channels in the lower limb pass upwards and pierce the deep fascia at the saphenous opening. From this point they then run in the perivenous tissues around the common femoral, the external, and the common iliac veins, in the loose connective tissue that surrounds these vessels.

Though the importance of the lymphatic system in inflammatory conditions is well known, the importance of its regenerative capacities is not often recognised in relation to surgery generally. If this lymphatic regeneration did not take place, practically all extensive operations, or for that matter injuries, would be followed by some degree or other of persistent lymphœdema.

This regenerative capacity has been demonstrated experimentally by Reichert (1926, 1931), who has shown that in animals it is possible to divide all the tissues of the limb with the exception of the bone, the main artery, and the main vein, and to study the phase of regeneration in the limb. In animals in which this experiment has been carried out, the maximum swelling of the limb is present on the 4th or 5th day, and has subsided completely by the 7th or 8th day. It was also shown that arterial vessels crossed the operative field about the 3rd day and that venous and lymphatic channels had not regenerated until the 4th day when the œdema was beginning to subside. It was also found that once the limb had reached its maximum swelling, or was just subsiding, the femoral vein, the only patent venous channel, could be ligated with impunity. In these circumstances neither gangrene nor further œdema occurred and the delay in the subsidence of the œdema was only one or two days. These experiments demonstrate the regenerative capacity of the lymphatics, the importance of the lymphatico-venous system in getting rid of œdema, and the fact that the main venous trunk can be ligatured with impunity.

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The clinical condition most closely allied to that found in femoral thrombosis is the persisting œdema of the upper limb found in some cases in carcinoma of the breast. The evidence suggests that this is always associated with the lymphatic obstruction in the glands by malignant cells. It starts peripherally and is aggravated by posture and exercise. There is no collateral circulation nor any evidence of associated venous obstruction. It is doubtful if any extensive operation itself can ever be responsible for the condition.

Pulmonary emboli also throw light on this subject. Very few of the patients who come to post-mortem as the result of a pulmonary embolus have had an antecedent "white leg." The embolus is, as a rule, the first and final manifestation of a latent thrombosis. On the other hand, of patients who have a manifest "white leg" or deep femoral thrombosis, only about a tenth develop pulmonary emboli. The suggestion is put forward that in the former group the venous thrombosis is not associated with any perivenous change and the clot is but lightly adherent to the vessel wall. In the cases of manifest thrombosis, it is suggested that a perivenous lymphangitis is the primary condition and that this is followed by phlebitis and secondary thrombosis of the vessel. In these circumstances the thrombus is closely adherent to the vessel wall as the result of the local inflammatory change, and for these reasons is much less likely to migrate and give rise to embolism.

SUMMARY

1. A series of 85 cases of femoral thrombosis is reported as part of a series of 1300 cases of peripheral vascular or lymphatic disease. In all of these there was a definite cause, an acute onset, and a varying period of disability.

2. The present paper is concerned especially with the ultimate clinical results of deep thrombosis.

3. In the 85 cases recorded, the thrombosis was associated with parturition or abortion in 39, with the post-operative state in 17, with typhoid fever in 12, and with infections of the lungs or pleura in 7. The remaining cases were associated with influenza, phlebitis, fracture, ulcerative colitis, and erysipelas.

4. The condition was unilateral in 64 cases and bilateral in 21. In the unilateral cases, the right side was involved in 18 and the left in 46.

5. The clinical sequelæ included discomfort and pain, œdema, varicosities of the limb or the trunk, and changes in the skin and subcutaneous tissues of the nature of dermatitis, ulceration, phlebitis, periphlebitis, and scleroderma.

6. Typically, the patient is left with a functionally damaged limb which is a constant source of discomfort, disability, and anxiety. In general, the degree of disability is proportionate to the amount of œdema.

7. In no patient in the series did the limb return entirely to normal. In 2 cases the evidence suggested a pure thrombosis, in 61 a pure lymphangitis, and in 22 a combination of thrombosis and lymphangitis.

8. The nature and extent of the abdominal collateral circulation developing in these cases are analysed.

9. Ulceration of the limb was present at some time or other in 26 of the 85 cases (30·6 per cent.). These ulcers were chronic and intractable and associated with extensive inflammatory changes.

10. Attacks of phlebitis occurred in 9 of the 85 cases (10·6 per cent.), either in single attacks or in the form of recurrent attacks.

11. Treatment is discussed in relation to the acute, transitional, and remote periods, and the treatment of varicosities and of ulceration is also considered.

12. The incidence of femoral thrombosis is discussed and it is estimated that some 5000 cases occur annually in this country. The various ætiological and pathological features of femoral thrombosis are reviewed as well as the experimental evidence in this connexion.

13. The clinical evidence supports the view that lymphatic obstruction is responsible for the œdema which is a characteristic feature of femoral thrombosis at all stages of the disease. From the experimental evidence, venous ligature will not produce œdema.

14. In patients dying as the result of a pulmonary embolus, the embolus is, as a rule, the first and final manifestation of a latent thrombosis, and few have had the clinical manifestations of an antecedent "white leg."

15. It is suggested that in cases of manifest femoral thrombosis a perivenous lymphangitis is the primary condition and this is followed by phlebitis and secondary thrombosis of the vessel. In these circumstances the thrombus is closely adherent to the vessel wall.

16. In latent thrombosis that is without clinical manifestations, the thrombosis is not associated with any perivenous change and the clot is but lightly adherent to the vessel wall. For this reason emboli are likely to occur.

17. The difficulties of nomenclature in connexion with the term "femoral thrombosis" are discussed.

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Clinical and Laboratory Notes

SULPHANILAMIDE IN THE TREATMENT OF ACTINOMYCOSIS

BY OLIVER WALKER, M.B. Liverp.
R.A.M.C.

THE following case is of interest not only as an example of a veritable deluge of afflictions but because of the dramatic improvement following administration of sulphanilamide. I do not claim that post hoc est propter hoc even if the agent is sulphanilamide, but in view of the apparent cure of a very fatal condition, I must recommend that this remedy be given a trial in the treatment of actinomycosis.

A. B., aged 23, a soldier, was admitted to the Queen Alexandra Military Hospital, Millbank, in September, 1937, with a gangrenous appendix. A persistent discharging sinus ensued and this was explored in November but failed to close. At this time he was found to be suffering from a pituitary tumour, which manifested itself by headaches, almost complete bitemporal hemianopia, diminution of visual acuity, absence of hair on the face and body, eunuch type of hands, round forearms, and a tendency to a female distribution of fat. In December he had an attack of tonsillitis which was followed by nephritis and mastoiditis. Actinomyces were first demonstrated

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in the pus from the discharging abdominal sinus on Feb. 1st, 1938, when a mass filling the right iliac fossa was readily palpable. Potassium iodide and later Lugol's iodine were administered without apparent benefit. On March 3rd the discharge was as profuse as ever and "sulphur granules" showing typical filaments of actinomycosis microscopically were readily demonstrable.

From March 4th to 10th inclusive sulphanilamide, 1·0 gramme thrice daily by mouth, was administered, and this treatment was rapidly followed by lessening of the purulent discharge and disappearance of "sulphur granules." So remarkable was the result that the treatment was repeated on March 20th for a further five days. On March 29th there had been no discharge for four days and the sinus had closed. Deep X ray therapy to the pituitary region was then begun and iron was given for the secondary anæmia. I saw the patient again on May 12th, when the abdominal wound was firmly healed, the mass in the right iliac fossa had entirely disappeared, the abdominal discomfort had vanished, and the general health was greatly improved.

I wish to acknowledge, with thanks, permission granted by the Officer Commanding, Queen Alexandra Military Hospital, Millbank, S.W.1, to record this case.

PREGNANCY FOLLOWING INDUCED CYSTIC CHANGES IN THE OVARIES

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AND
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GONADOTROPHIC preparations can induce growth and cystic changes in the ovaries of the common laboratory mammals. During the earlier years of reproductive life they may cause similar changes in women [1] and caution has been advised,[2] and should still be urged, in the use of potent gonadotrophic extracts lest the ovaries suffer some irreversible deleterious change. We have been able to collect certain data on the duration of the effects brought about in the primate ovary by two types of gonadotrophic substance, the one an extract of sheep pituitary and the second derived from the serum of pregnant mares. Both preparations are used clinically, and both are assayed in terms of mouse or rat units.

Our observations were made on four immature and young adult rhesus monkeys (*Macaca mulatta*) which became pregnant at various times after they had been subjected to intermittent or daily injections of large amounts of the extracts. The first animal was given 8250 R.U. of a gonadotrophic extract of sheep pituitary on the 23rd day of its second observed menstrual cycle. Uterine bleeding began three days later and lasted three days. From the 4th to the 10th day of its fourth observed cycle it was given 750 R.U. of the same extract daily (total 7500 R.U.). At laparotomy two days after the last injection both ovaries were found to be cystic and greatly enlarged. The left ovary was removed. Uterine bleeding did not begin again until 27 days later. It is likely that the long interval between the unilateral ovariectomy and the ensuing menstruation was due to a high level of œstrogenic secretion maintained by the remaining cystic ovary. The monkey was given a similar course of injections six months later, but on this occasion uterine bleeding began the day after the last of the ten injections. Four months later the animal was successfully mated, pregnancy occurring in spite of the fact that it possessed only one ovary which on two, and possibly three, occasions had been made cystic by excessive gonadotrophic stimulation.

The second animal was given two injections of mare serum (400 R.U. and 1500 R.U. respectively), the injections being separated by a six-month interval. Shortly after the second injection it was mated only once and pregnancy supervened. The third and fourth animals, which were much younger, received 75 R.U. and 300 R.U. of mare serum daily over periods of six months and eight months respectively, during which time they matured and began to have regular cycles. These animals were not mated until after the injections were discontinued. They became pregnant in spite of the fact that early menstrual cycles in the rhesus monkey are usually anovulatory. In each case an exploratory laparotomy had demonstrated that the initial effect of the injected hormone was to enlarge the ovary to four or more times its normal size. It thus follows that both the cystic ovarian condition and the consequent disturbances in the menstrual rhythm which are caused in monkeys by gonadotrophic hormones are only transitory, and that they can be followed within a short time by normal pregnancy and normal lactation. These observations on monkeys are in harmony with observations which have been made on rabbits, rats, and other laboratory mammals.

This investigation was made possible by a grant from the fluid research funds of Yale University school of medicine. An extract of sheep pituitary for experimental use was generously supplied by Dr. Oliver Kamm of Messrs. Parke, Davis and Co., and mare serum, untreated except for being passed through a Berkefeld filter, was furnished by Dr. H. H. Cole of the University of California.

[1] Kurzrok, R., and Smith, P. E., Chap. XVII in The Pituitary Gland. Baltimore, 1938.
[2] Editorial: Clinical Application of Hormones of Anterior Pituitary and Gonads, *J. Amer. med. Ass.* 1936, 107, 1390.

VIENNA AND ENGLISH MEDICINE

THE history of medicine has some pleasant byways, and one of these has recently been explored by Dr. William Steedman, who has published a short review in the *Wiener Medizinische Wochenschrift* (1938, No. 14) entitled "English influence on Viennese medicine in the 18th century." He is concerned chiefly with the evidence afforded by the medical journals published in Vienna: the first of which, Kirchvogel's *Physical and Medical Diary* began in 1773 and lived into the 19th century. Kirchvogel proclaimed himself a follower of Sydenham, and his abstracts and criticisms were largely a reflection of English theory and practice. Later journals followed much the same path and up to the end of the century Vienna received the bulk of its foreign medical information from English sources. Dr. Steedman thinks that the original cause which led to this close relationship was that the two great schools of Vienna and of Edinburgh were both founded by pupils of the great Boerhaave: Edinburgh in 1726 and Vienna in 1745. Moreover Boerhaave himself was an eminent pupil of Archibald Pitcairn in Leyden, and Pitcairn was an enthusiastic follower of Sydenham. As late as 1786 Sydenham's works were translated into German at Vienna by Mastalir, who gave the first impulse to the study of pædiatrics in Vienna. The story serves to remind us that even in a Europe distracted by wars medical science was already an international bond.

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MEDICAL SOCIETIES

ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION

AT a quarterly general meeting of this association held on March 20th, with the president, Dr. DOUGLAS MCRAE, in the chair, a discussion on the alleged

Shortage of Medical Officers in Mental Hospitals

was opened by Dr. J. A. F. DENYSSEN. It was agreed on all sides, he declared, that in most mental hospitals insufficient individual attention was being paid to patients who clearly needed it. The cause was the inadequacy of the medical staff, aggravated by the heavy and increasing burden of routine work. Recent valuable advances in psychological medicine were therefore not being used. Knowledge had increased greatly in the last twenty years but treatment had hardly improved at all. Cardiazol therapy had made great strides on the Continent and was being tested in several hospitals; but, as authorities pointed out, an indispensable part of the treatment was psychotherapy, to enable the patient to understand and digest his psychic experiences during the treatment. Inadequate staffing made psychotherapy largely impossible. Routine work included ward visits and rounds, statutory mental and physical examinations, care of the physically sick, reports, lectures, interviews with relatives, instruction of nurses, participation in recreational activities, and dealing with everyday problems. These duties were continually augmented by an increasing number of operations at which the assistants had to coöperate with visiting specialists. Holiday leave reduced the strength over a considerable part of the year. Sir Laurence Brock, chairman of the Board of Control, had pointed out two years ago [1] that adequate staffing of mental hospitals would not only enable medical officers to give patients more individual attention and treatment but to undertake more clinical and pathological research. They needed also more leisure to keep abreast of advances and to attend meetings, clinics, and refresher courses. The present deadening atmosphere (said Dr. Denyssen) was bad for work and destroyed the interest of mental hospital officers in the service. Clinical material was available in abundance for coöperative psychiatrical research if advantage were only taken of it. The staff should be encouraged to be non-resident, so that they might form freshening social contacts. To attract the right type of man the service must be made a career, with reasonably good remuneration and prospects of promotion. At present the higher posts were all administrative, and a man whose chief interests were clinical could find no opportunity for advancement. The services of promising clinical and research workers were lost through their absorption into the administrative machinery. It was the duty of members to initiate progressive steps rather than complacently to wait for evolutionary processes to solve their problems. The public must be educated to produce the required financial support. Superintendents were in a strategic position, for they were in close contact with lay officials and committees.

A paper by Dr. A. G. DUNCAN was read by Dr. W. G. MASEFIELD, the honorary secretary. Dr. Duncan also quoted observations made by the chairman of the Board of Control on the depressing steadiness of the recovery-rate and the shortage of medical staff. The normal proportion in this country was one doctor to 350 patients, and a ratio of 1 in 450 or 500 was not unknown. In continental hospitals one doctor was provided for each 160 patients or even less. Dr. Duncan saw little value in any attempt to estimate by simple proportion the minimum number required. He proposed a formula which would also take into account the size of the hospital and the admission-rate; one doctor for every 500 patients, plus one for every 150 admitted every year, plus one if the hospital had more than 2000 beds. Arithmetically, the medical superintendent did not count, for his clinical work did not lessen that of the assistants. On this basis, a hospital of 1060 beds with an admission-rate of 245 required a minimum of four assistants, and one of 2550 beds with 400 admissions a year required 9 assistants. Out of 42 local authority hospitals, 12 appeared from the figures for 1936 to have the minimum staff, 19 had one less, 4 had 2 less, and 7 had more than 2 less. Sir Laurence Brock attributed the shortage largely due to lack of imagination on the part of the visiting committees. Dr. Duncan pointed out, however, that it was by no means easy to secure and retain doctors of the standard required. With some difficulty, more or less unsatisfactory locum tenents could be found. The reasons why good men left the service were many. Routine work was apt to be uninteresting and uninspiring, and the assistant could not often find any interest outside the ward work which would keep him from intellectual stagnation. This interest need not necessarily be called research or be done in the laboratory. Research was not necessarily highly specialised work. It would be most unfortunate if younger medical officers were given the impression that the elucidation of psychiatric problems was no concern of theirs. Every assistant medical officer should be a research worker in the broader sense. The wards and the record office provided ample material. It was sometimes asked why this country had not produced a Freud, a Jung, or a Janet. There was some significance in the reflection that only one or two of the outstanding continental psychiatrists had influenced by their work the recovery-rate of psychotics. The policy of appointing lay administrators was impracticable and would not be welcomed by assistant medical officers.

The PRESIDENT said that he felt particularly strongly on the subject because, being interested in research, he had spent many years as an assistant medical officer at the Maudsley Hospital at £100 a year and his contemporaries had in course of time fulfilled the only possible ambition of an assistant medical officer; to be made a superintendent and to marry. He blamed the Board of Control for imposing on medical officers a mass of useless routine work which destroyed what intellect they might possess. Assistants nowadays seemed to spend their whole leisure outside the hospital. He hardly ever met one who would really get down to work, or would consider any kind of research without being given not only the idea but also a detailed technique. Every medical superintendent would welcome and encourage an assistant who was keen on research. In county asylums the recovery-rate had dropped because so many of the cases admitted had been tinkered with outside in a variety of ways until their hope of recovery was gone. Mental hospitals were

[1] See *Lancet*, 1936, 2, 149.

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said to produce a lower recovery-rate than medical or surgical clinics, but these did not keep their failures.

Dr. E. J. FITZGERALD recalled the report of a committee appointed by the association in 1914, which might appropriately be read to-day. In the Irish service assistant medical officers were allowed to marry. The more assistants recruited, the fewer would have the chance of becoming superintendents and getting a living wage. Too large a gap existed between the remuneration of a superintendent and of his deputy. He would advise any son of his to keep out of the service; its members were looked down upon by other medical men as failures, and some superintendents would provide no facilities for research and even forbade it. He advocated the appointment of house physicians—not clinical assistants at £60 a year, and not the kind of men to whom incipient mental cases were sent—men on the fringe of Harley-street who did not know a psychotic, and certainly did not know a mental defective, when they saw one.

Dr. J. J. B. MARTIN said that when he had asked his committee for more staff for his hospital, they had suggested that the present establishment of four assistant medical officers for 1200 patients was too many, on the basis that the public assistance institution containing 900 patients and a similar number of new admissions annually was run perfectly well by one medical officer. To the further criticism that the new treatments had made no fraction of difference in the recovery-rate and that there was no work in a mental hospital for an efficient doctor, Dr. Martin had replied that his assistants had considerably less clinical work than an ordinary general practitioner and spent most of their time compiling useless statutory notes which they realised would only be relegated to the cellar unless some special inquiry were held. The committee had refused to pay medical men for doing work which a clerk could do. They pointed out that 80 per cent. of the recoveries were in the first-year admissions, and were prepared to spend as much as they could afford on work for these patients and for research. The hospital had made no appreciable contribution to medical science for years, and this was true of the average mental hospital. The conclusion was that medical work was much more valuable outside the hospital than inside. Extramural activities should be largely extended, and then the complaint of the assistant that he had nothing to do worth doing would pass away.

Dr. K. C. BAILEY pointed to the difficulty of obtaining cases early enough for the new treatments. In a Swiss hospital he had visited, which contained nine resident doctors for 1000 patients, the staff did much less routine work and much more psychotherapy. There was probably not a mental hospital in this country which did any real psychotherapy, through lack of training and time. The sterile atmosphere of the mental hospital was largely the fault of the medical superintendent.

Dr. DONALD BLAIR supported the proposal to appoint house physicians, as this would give a number of general practitioners badly needed knowledge of psychiatry and induce them to send their cases earlier. A system of clinics should be established in connexion with mental hospitals; the work in them would add much interest to the life of the assistant. In some county areas with more than one hospital an incalculable amount of research work could be done in organised coöperation.

Dr. W. J. T. KIMBER said that the number of his assistants exceeded that laid down by Dr. Duncan's formula. He had six assistants, two of whom ranked as house physicians, a pathologist, and four psychiatric social workers. Neither he nor his committee regarded the number as excessive. There was much clinical work to be done in a mental hospital, and attendance at social functions was a definite part of therapy. His hospital also had six visiting psychotherapists who instructed the junior medical officers. House physicians served for twelve months, and received a grounding in the work of practical psychotherapy, to some extent on analytical lines. His assistants were keen, did not work as hard as the average general practitioner, and gained a much better approach to their patients' minds.

Dr. A. A. W. PETRIE advocated the establishment of psychiatric units with teams of full-time workers on various problems. Each assistant ought to be given definite work apart from routine, perhaps outside the hospital, or on clinical or pathological problems, or on occupational therapy or psychotherapy.

Prof. D. K. HENDERSON said that one difficulty was that most assistants desired to spend time reading for their D.P.M. or M.R.C.P. There were many cogent arguments against numerous specialised degrees as a requirement for appointments. Out-patient departments and psychiatric clinics had to be developed to deal with early cases, but the bulk of psychiatric work would always be done in the mental hospital. Assistant physicians trained to look upon patients as biologically faulty adaptations and not as pathological specimens would have a stimulus to clinical work. Clinical staff meetings would remedy the present preoccupation of the superintendent with administrative duties. Nothing was more stimulating or constructive to the younger men than staff meetings at which new admissions were discussed, the assistant first presenting the case.

Sir LAURENCE BROCK said he had never intended to suggest that the proper proportion of medical staff to patients could be found by a mathematical formula. The only scientific method was to consider how many wards in the particular hospital a medical officer could take. The out-patients and the new admissions were not the only patients requiring psychiatric attention. Much psychotherapy ought to be done even among chronic cases. He had hoped to hear more about the appointment of part-time medical officers, particularly in clinics. An experiment on those lines might do something to meet the criticism that many out-patient clinics were mainly diagnostic and did not do continuous psychotherapy. Committees might be more ready to agree to the appointment of part-time officers, who would not be pensionable. The plan might also provide for more psychiatrists in private practice, a very grave need. Medical men were apt to regard the psychiatrist as to some extent inferior through being in a safe occupation. There was room for a more adventurous spirit in psychiatric medicine.

Dr. DONALD ROSS pointed out that advertisements of vacant mental hospital appointments attracted no applicants.

Dr. BLAIR said that to gain promotion he would have to take his M.R.C.P. He would gladly do this, but could not without taking a course that would swallow up the leave due to him on full and half pay and necessitate more leave without pay. He would have to give up his work on Cardiazol and insulin.

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Some candidates for posts were told that an M.D. Lond. in psychiatry was not enough. The fighting services paid their medical officers to take advanced qualifications.

Dr. C. J. C. EARL asked who would teach the young assistant. The superintendent had too much administrative work. The real reason why psychological treatment was not given by assistants was that the superintendent did not want them to give it. The only chance for a man who wanted to do special work was to retire to the laboratory.

Dr. E. O. LEWIS declared that an assistant could not give adequate treatment to each patient under present conditions. There was work in every large mental hospital for a full-time psychotherapist. Chronic patients needed time spent on understanding their everyday problems.

Sir HUBERT BOND asked whether there was a shortage of officers for work that was really needed. The "routine work" at present demanded was in the interests of the patient. To record the examination of a patient was considered indispensable in other branches of medicine. It was a necessary foundation for the next step in treatment.

Dr. L. W. RUSSELL said he selected patients who would best benefit by personal treatment.

Dr. R. PAKENHAM-WALSH suggested that routine records should not be relegated to the cellar but should be used as material for research. Work on spontaneous remission in schizophrenia could not be done without them.

Dr. J. I. RUSSELL said that conditions had not improved since 1912. He had three assistants for 1000 patients, and one was on holiday for a large part of the year.

Prof. J. H. MACDONALD said that the ideal mental hospital should not hold more than about 700 patients. Smaller hospitals would mean more medical superintendents.

TUBERCULOSIS ASSOCIATION

AT a meeting of this association, held in London on May 20th, the president, Dr. S. R. GLOYNE, being in the chair, a discussion on

Trauma and Tuberculosis

was opened by Dr. J. BROWNING ALEXANDER who confined his remarks to trauma in relation to *pulmonary* tuberculosis, defining trauma as "injury caused by external violence." Since tuberculosis could be caused by no other agent than the tubercle bacillus, what they had to consider was, how trauma could (1) reactivate an old quiescent lesion, or (2) aggravate an already existing infection. Of reactivation there was ample clinical evidence, but experimental confirmation was scanty and difficult to obtain. In a patient already suffering from pulmonary tuberculosis, especially one with long-standing chronic disease, a blow to the chest wall might result in a severe hæmorrhage and dissemination of tubercle bacilli to hitherto unaffected parts of the lungs. The time-interval was important. Serious aggravation showed itself in three or four days after the accident, by fever and X ray appearances of freshly developed broncho-pneumonia. A spread demonstrated for the first time three or four months later was not likely to be due to the hæmorrhage. Trauma when followed immediately by pneumothorax or pneumopericardium must be admitted as causing aggravation of a pre-existing lesion. The usual causes of spontaneous pneumothorax were ulceration of a subpleural tubercle, rupture of an emphysematous bulla, or tearing of an adhesion immediately above the diseased portion of a lung. Apart from stabbing or fracture of a rib, a healthy lung did not rupture. Another form of tuberculosis which might reasonably be attributed to trauma was miliary tuberculosis, as in a case cited by Parkes Weber, where a blow on the testicle led to the dissemination of tuberculosis in the lungs; or in another case where miliary spread took place after forcible manipulation of a tuberculous joint. More difficult cases were those in which pulmonary tuberculosis arose after trauma to a part of the body outside the chest. For example, a man with a fractured femur might become debilitated from prolonged residence in hospital and succumb to tuberculosis at a later date. In such a case the causal relationship would have to be decided by consideration of the sequence of events in the interval. The complete absence of signs or symptoms of tuberculosis for (say) three months after an accident would negative any causal relationship between the two events.

Dr. J. G. JOHNSTONE spoke of trauma in relation to tuberculosis of *bones and joints*. A study of their blood-supply was important. The minute vascular arrangement at the epiphysis and metaphysis of bones was different from the diaphysis. Although the blood-vessels were abundant, the minute arterial capillaries terminated in a widened bay with a poor venous return, and there was a distinct diminution of the phagocytic cellular elements of the blood, in contrast to the medulla, where the blood-supply was not only abundant and rapid, but was also rich in cellular elements. A combination of sluggishness in the blood stream and lack of phagocytic elements in any site rendered it more vulnerable to hæmatogenous infection—a vulnerability which was obviously increased by trauma. In acute infections the relationship was more easily established than was the case with tuberculosis. If any relationship existed between trauma and tuberculosis of bones and joints it was usually in association with a minor injury. He could not, he said, recall a single case of gross joint injury that developed tuberculous arthritis in the injured part. From the many hundreds of cases that had passed through his hands, he placed trauma as a causal factor in from some 15–20 per cent. In four other groups of cases it was easier to incriminate trauma as the predisposing cause owing to the reduction or absence of time lag between the injury and the appearance of clinical symptoms. These groups were: (1) traumatic inoculation of tubercle bacilli; (2) traumatic exacerbation of a latent but active lesion; (3) traumatic aggravation of a known active lesion; (4) traumatic reactivation of an old healed lesion. In all these groups the X ray evidence of mischief was more conclusive. Trauma, he concluded, must be regarded as a definite predisposing cause of tuberculous disease of bones and joints; the chief difficulty was to decide when it was the main factor.

LEGAL ASPECT

Mr. C. A. COLLINGWOOD, barrister-at-law, said that tuberculosis being a specific bacterial disease its local traumatic inception implied: (1) that the bacillus had been directly introduced into the system; (2) that the bacillus was already present, lying dormant in the tissues, and that the injured part

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was for the time being a locus minoris resistentiæ; or (3) that a pre-existent though quiescent tuberculous lesion had been aggravated. The majority of claims in respect of tuberculosis consequent upon trauma were brought under the Workmen's Compensation Act, in which the word accident was used in the ordinary sense of any untoward and unexpected event which occasioned hurt or loss. If the workman could show that his disease was a consequential result of accidental circumstances arising out of and in the course of his employment he would be entitled to compensation. Injury by disease alone, unaccompanied by accidental circumstances, was not one for which compensation could be claimed, except under the provisions of the Act relating to scheduled industrial diseases or to silicosis or asbestosis; nor did the fact that one man was more susceptible to infection than another constitute an accident. But given an accidental occurrence, the fact that at the time of the occurrence the man was suffering from a condition which made him more susceptible to injury would not prevent the occurrence from being accidental. The test applied was whether in substance the accident came from the disease alone, so that whatever the man had been doing it would probably have come all the same, or whether the employment contributed to it. In some cases distinction had to be drawn between aggravation and acceleration of the disease. When death resulted from the injury, it was immaterial that the deceased was suffering from such a condition of tuberculosis as would certainly have proved fatal in a short time, apart from the accident. This was because compensation in the case of death was a lump sum payable to the dependants of the deceased, thus differing from compensation for incapacity, payable weekly during incapacity. Where the effect of accident on a man already suffering from tuberculosis (or any other disease) was to accelerate the disease, so that he was put into a condition of incapacity sooner than he would otherwise have been, then the incapacity due to the accident would not last beyond that date at which he would in any event have been incapacitated. The question whether in a given case death or incapacity resulted from the injury resolved itself into a purely medical inquiry into the chain of causation, and whether this chain was broken by a *novus actus interveniens*. In the latter case the man could not succeed.

Anæsthetics in Thoracic Surgery

Opening the second discussion Dr. J. T. HUNTER said that in thoracic operations the *anæsthetist* was faced with greater difficulties than in any other branch of surgery, owing partly to technical problems, partly to the fact that the patient was debilitated or toxic from long-standing illness, and had a lowered vital capacity. No one method of anæsthesia could be suitable for all cases; the anæsthetist had to decide whether to use local infiltration, general anæsthesia, or special analgesia, alone or combined with intravenous or inhalation anæsthetic. In intrapleural operations such as pneumonectomy or lobectomy there was the further question of using intratracheal or intrabronchial intubation with suction. Preliminary medication should be light; it was undesirable to diminish the cough reflex to any extent. The most useful combination was probably Omnopon gr. ⅓ with scopolamine gr. 1/150 three-quarters of an hour before operation. Local anæsthesia was less often used in this country than on the Continent. The high spinal analgesia—Howard Jones technique modified by Magill and Rink and Harris—had proved excellent in lower lobectomy and thoracoplasty. The chief advantages of spinal anæsthesia were: (1) bleeding was reduced to a minimum; (2) the cough reflex was unimpaired; (3) respiration was undisturbed. Post-operative headache sometimes occurred. The fall in blood pressure could be met by intravenous injection of ephedrine. General anæsthesia was more commonly used in this country. Ether was quite unsuitable in thoracic surgery. Chloroform or divenyl ether might be useful adjuncts to gas-oxygen which alone was often inadequate to keep up a steady anæsthesia. Cyclopropane was nearly ideal, as it could be given with a high percentage of oxygen; it was non-toxic, non-irritating, and rapidly excreted; induction was rapid and pleasant, and the cough reflex could easily be maintained. It did, however, increase the bleeding and prolong the operation time. For the induction of A.P., resection of rib for empyema and operations on the phrenic nerve, local infiltration (novocain 1 per cent.) was suitable. For thoracoplasty he still used gas-oxygen combined with careful premedication. When the rib resection was actually started, 1½ litres of tap water with glucose were run into the rectum. For apicolysis and extra-pleural pneumothorax, where quiet respiration and a minimum of movement must be aimed at, cyclopropane had proved superior to gas-oxygen. When thoracotomy was in question for abscess, carcinoma, or mediastinal tumour, spinal anæsthesia might be suitable where there was little or no sputum. With copious sputum, tracheal or bronchial intubation should be used. At the Brompton Hospital bronchoscopy was always carried out under local anæsthesia, with preliminary omnopon and scopolamine.

Mr. J. B. HUNTER, speaking from the point of view of the *surgeon*, said that an anæsthetic should be safe, should not upset the patient mentally, should reduce movement to a minimum, and should not give rise to complications. Local anæsthesia was doubtless the safest, and was usually combined with morphia, omnopon and scopolamine, or Nembutal. Ether was quite unsuitable for lung cases, but was valuable in operations on the heart, especially cardiolysis, where basal narcotics were best avoided. Gas-oxygen, although safe, had the disadvantage of causing considerable respiratory movement. This, however, could be largely overcome by adequate CO_2 absorption arrangements and the proper administration of basal anæsthetics. Cyclopropane, of which he had little experience, could not, except with an absolutely closed circuit, be used with diathermy. Hæmorrhage appeared to be much greater with cyclopropane than with other forms of anæsthesia. Relaxation was not a necessity in chest surgery, and spinal anæsthesia was not free from post-operative complications. Of the basal anæsthetics he believed Avertin to be the best. The patient was unconscious and was readily controlled with gas-oxygen, while the cough reflex was never abolished. The use of atropine, while necessary where ether was employed, was harmful with other anæsthetics, producing a type of extremely viscid mucus impossible to expel; it was in his opinion a possible cause of atelectasis. He was in favour of passing an intratracheal tube, which gave a better controlled and quieter anæsthesia than with the gas mask alone. Passing a suction catheter into the bronchus of the affected side was, he thought, harmful, aspirating not only mucus but air from the bronchial tree with consequent collapse. Suction should be confined to the trachea where a small catheter could not produce enough negative pressure to do harm.

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REVIEWS AND NOTICES OF BOOKS

Collapse Therapy of Pulmonary Tuberculosis

By JOHN ALEXANDER, B.S., M.D., F.A.C.S., Professor of Surgery, University of Michigan; Surgeon-in-charge, Division of Thoracic Surgery, Department of Surgery of the University. London: Baillière, Tindall and Cox. 1937. Pp. 705. 67*s.* 6*d.*

As a contribution to thoracic surgery this book deserves commendation as much for the industry expended in its composition as for the completeness of its contents. It tells the story of the collapse therapy of phthisis from the beginning until the present day, weighing carefully the pros and cons of each individual operation and its modifications and indicating its sphere of usefulness either alone or in combination with others. It opens with an account of the improved results that have attended the use of collapse therapy in conjunction with sanatorium régime, and we are reminded (should our leanings be too conservative) that 85 per cent. of the cavities which remain patent kill their hosts within three years. In two excellent chapters on the physiology and pathology of pulmonary collapse Dr. Max Pinner deals effectively with an important aspect of the problem that is often neglected. The various procedures are then described in detail, Dr. J. B. Barnwell and Dr. K. S. Howlett, jun., contributing articles respectively on pneumothorax and oleothorax. The section devoted to the extrapleural pneumothorax is already out of date, and the author's statement that this measure is unlikely to find favour is certainly not true in this country to-day, although it may well be so to-morrow. It is a pity, also, that the work of J. Holst and C. Semb was published too late to receive more than a footnote of recognition. Semb's operation of extrafascial apicolysis with thoracoplasty may not appeal to every thoracic surgeon, but it was certainly an advance towards attaining selective concentric relaxation of the diseased area of lung which is the basic principle underlying collapse procedures to-day. Following chapters recounting the surgical drainage of cavities and the treatment of tuberculous empyema the book closes with an extensive bibliography.

The publishers should note that the use of a large page with fairly small print running right across it without a break is tiring for the reader; but this defect is offset by the excellence of the subject matter.

Précis de diagnostic chirurgical

By CH. LENORMANT, Professeur de Clinique Chirurgicale à la Faculté de Médecine de Paris; PIERRE WILMOTH, Professeur Agrégé à la Faculté; JEAN PATEL, Chirurgien des Hôpitaux de Paris; GEORGES MENEGAUX, Professeur Agrégé à la Faculté; and JEAN SÉNÈQUE, Professeur Agrégé à la Faculté. Paris: Masson et Cie. 1937. Pp. 2846. In 4 volumes. Frs.390.

THESE four handy volumes describe surgical diagnosis in some detail. The information they contain is easy to find, up to date, and simply and clearly set out. The books are illustrated by good photographs and particularly by good radiograms, each accompanied by a fully labelled outline explanatory drawing. The value of the book is enhanced by the short reference to the accepted treatments for the various conditions differentiated. Not many English undergraduates would be disposed to study a book on diagnosis of this size in a foreign language, but for the practising surgeon, and particularly for those engaged in teaching surgery, it provides pleasant, interesting, and profitable reading. It is in fact a very good treatise on surgical diagnosis, and although the whole work is long there is no useless repetition.

Appendicitis

By W. H. BOWEN, M.S. Lond., F.R.C.S., Surgeon to Addenbrooke's Hospital, Cambridge; Examiner in Surgery, University of Cambridge. Cambridge: At the University Press. 1937. Pp. 201. 7*s.* 6*d.*

THIS is not a book for surgeons, but some practitioners may profit from reading it. It is a good straightforward clinical account of appendicitis, but it brings no new clinical facts to light, it does not supply large statistical data or any new knowledge that would help to solve some of the problems appendicitis still presents. With much that the author writes we cordially agree. It is good to read his warning against the very early emergence from bed after the operation, his sensible comments on the question of drainage, and his recommendation to remove the appendix whenever possible in the presence of abscess. But when it comes to the complications which may arise we find his message indecisive and unhelpful. For instance, mechanical obstruction after the operation may be a rare but it is a very real problem; the clinical account of this condition is very meagre and the statements on its pathology and treatment quite vague. We cannot agree (p. 142) that "if a definite collection of pus in Douglas's pouch is found" when convalescence is disturbed by persistent fever "it is difficult to decide what is best to be done." The fact that the author has so little to say about complications does credit to the clinical acumen and prompt action of the practitioners in his neighbourhood; but his readers may be less fortunate and are likely to be disappointed if the difficulties that may arise following laparotomy and appendicectomy are not fully discussed in a monograph of this kind.

Wheeler and Jack's Handbook of Medicine

Tenth edition. Revised by JOHN HENDERSON, M.D., F.R.C.P.S. Glasg. Edinburgh: E. and S. Livingstone. 1937. Pp. 703. 12*s.* 6*d.*

CRITICS and reviewers are reminded in the preface that this tenth edition of an old favourite only claims to be a handbook and not a text-book of medicine. As it is a volume of convenient size, well bound and printed, and issued at a very reasonable price, this distinction should be borne in mind; but in scope, utility, and length it must face comparison with the shorter text-books, unfortunately to its disadvantage. As a clear synopsis of modern medicine and as a ready reference for the student it has now been bettered and the advantage of its light weight is overbalanced by the heaviness of its style which savours of the era of the top hat. Few modern practitioners use the word gastroxynsis and the understatement that X ray examination in the diagnosis of pulmonary tuberculosis is "often helpful" is not only out of date but dangerous. Equally misleading, to choose another example, is the section on bronchiectasis where the student will find that "incision and drainage of the cavities have often proved

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successful," and yet no mention of postural drainage. The sections on the anæmias and on gastric disorders have been rewritten, but even here in the differential diagnosis of cancer of the colon and rectum diverticulitis is ignored. In other places throughout the book many additions indicate the care the reviser has taken in his difficult if not impossible task.

Eyestrain and Convergence

By N. A. STUTTERHEIM, M.D. Rand, Part-time Ophthalmic Surgeon to the Johannesburg School Clinic, Transvaal Education Department; late Assistant, Eye Clinic, University, Leyden. London: H. K. Lewis and Co. 1937. Pp. 89. 7*s.* 6*d.*

Dr. Stutterheim's conception of convergence is that it represents an autonomic power of the mind (or brain) which manifests itself in the basic movement of the dual eyes and forms the kinetic principle of bifoveal single vision; according to this idea convergence acts by visual reflexes only and not through volition or indeed consciously at all. His thesis is that the human eyes, being, in the primary position, not parallel but divergent, have in this position stability and perfect elasticity. The extrinsic ocular muscles act as tensors and not as antagonists. Convergence is brought about as much through the inhibition of opposing muscles as through contraction of the convergence muscles, though during vision the muscles of convergence are kept in constant action. These ideas are the grounds for Dr. Stutterheim's belief that convergence has a kinetic factor and that its basic movement is the kinetic principle of human binocular vision. This power of convergence is phylogenetically young and in some cases is unable to stand up to the visual requirements of modern civilised life. A breakdown is manifested by eyestrain, headaches, photophobia, amblyopia, and in severe cases by contracted visual field. The author has shown that the power range of convergence is more than twice as great in normal persons as in those suffering from eyestrain, and his demonstration that eyestrain is often accompanied by a poorly working kinetic reflex of bifoveal or human binocular vision lends support to his thesis.

The technique of investigating, diagnosing, and treating cases of eyestrain which have no refractive error is clearly described. Dr. Stutterheim emphasises the fact that this form of treatment is physiological and not physical; the voluntary element necessary for "exercises" is absent. He also discusses the equipment necessary for examination and treatment and his records show that good results are mostly achieved by 24 daily treatments of 10 minutes each, some seven tests with prisms being performed in the course of each treatment.

The book is worth reading for its content of practical information on a subject that often fails to awaken the interest of practising ophthalmologists. It seems from the author's dramatic results that this treatment is well worth trying in these difficult cases. A summary of the book is supplied in five languages with a survey of the results set out in a tabulated form, and clinical notes of typical cases.

Quarterly Journal of Medicine

THE April issue contains the following papers:—

A PRELIMINARY REPORT ON THE VALUE OF STOCK VACCINE IN THE TREATMENT OF PNEUMONIA. By J. H. Bolton (Royal Melbourne Hospital, Australia). The vaccine contained Types I, II, and III, and one of the Group IV pneumococci, a streptococcus, and *Micrococcus catarrhalis*, in equal numbers, and 600 million organisms were given, within 3 days of onset, to 32 cases of primary lobar or broncho-pneumonia. Comparison was made with a control series of 136 cases. Perfect random sampling was not obtained, but statistical analysis of the results gives the conclusion that vaccine treatment appears to shorten the mean duration of uncomplicated pneumonia from 8·7 to 5·7 days (mean difference 3·05±0·85 days); it does not affect the mortality.

HYPOGONADISM ASSOCIATED WITH INVASION OF THE MID-BRAIN AND HYPOTHALAMUS BY A PINEAL TUMOUR. By R. A. Cleghorn, H. H. Hyland, J. R. F. Mills, and E. A. Linell (Toronto General Hospital). After a full clinical and pathological description of the case, and an extensive discussion of mechanisms, the authors conclude that the tumour disturbed the nerve-supply of the pituitary, causing an excessive secretion of luteinising hormone and a defective secretion of gonadotropic (and possibly also of thyrotropic and adrenotropic) factors.

MYELOMATOSIS. By Alice Stewart, in collaboration with F. Parkes Weber (Royal Free Hospital, London). Three cases of the plasma cell type and one of the rare lymphocyte type are described. All showed raised blood calcium without lowering of inorganic phosphorus. One had a macrocytic anæmia. Another showed hyperproteinæmia with failure of clot retraction, autohæmagglutination, and excessive rouleau formation. A third had a generalised tumour-like amyloidosis.

SOME OBSERVATIONS ON THE LÆVULOSE-TOLERANCE TEST. By C. P. Stewart, Harold Scarborough, and J. N. Davidson (Royal Infirmary, Edinburgh). Blood lævulose is estimated at half-hourly intervals for two hours after the ingestion of 50 grammes of lævulose. Normally it does not exceed 20 mg. per 100 c.cm. at 1 hour, or 8 mg. per 100 c.cm. at 2 hours. Observations on 130 cases indicate an increased usefulness for the test in this refined form. Diabetes does not interfere with it; arterio-sclerosis does.

TUBERCULOUS SPLENOMEGALY WITH MILIARY TUBERCULOSIS OF THE LUNGS. By R. A. Hickling (Charing Cross Hospital, London). Two cases are reported. In both the lungs showed the radiological appearances of miliary tuberculosis. In both the patients recovered normal health soon after splenectomy. In both many enlarged abdominal glands were present, and the excised spleen showed the histological appearances of tuberculosis without caseation; in one spleen, tubercle bacilli were demonstrated by staining methods.

INSULIN ANTAGONISM. By Alexander Glen and James Caithness Eaton (Victoria Infirmary, Glasgow). A diabetic woman, who had had the uterus and one ovary removed, became increasingly resistant to insulin, and eventually received 1050 units daily for a fortnight without showing diminution of glycosuria, on a diet containing 100 grammes carbohydrate. Acetonuria was absent, but appeared when insulin was withheld. When insulin injection was accompanied by intravenous infusion of phosphate solution, or by injection of 10,000 units of dihydroxycestrin, some lowering of blood-sugar occurred. Injection of the patient's serum into rabbits diminished their hypoglycæmic response to intravenous insulin. The authors suggest that it contained an insulin-antagonistic substance, probably of pituitary origin.

EXOPHTHALMIC OPHTHALMOPLEGIA. By W. Russell Brain (with a pathological report on the ocular muscles and thyroid glands by Hubert M. Turnbull). A review of the clinical features and relationships of this condition, based on a study of 31 cases. The ophthalmoplegia is attributed to the mechanical effect of a raised retro-ocular tension on the extrinsic muscles of the eyeball. The same rise of tension contributes to the exophthalmos; exophthalmos, with histological changes in the orbit similar to those found in the author's cases, has been produced experimentally in thyroidectomised guinea-pigs by administration of pituitary thyrotropic hormone.

FAMILIAL IDIOPATHIC METHÆMOGLOBINÆMIA. By E. H. Bensley, L. J. Rhea, and E. S. Mills (Montreal General Hospital). Symptomless cyanosis dating from childhood was found in a brother and a sister; it was due to methæmoglobin carried in the red cells (0·7 and 1·6 g. per 100 c.cm. blood). Poisons and excessive absorption of nitrites from the gut were excluded. Five cases of idiopathic methæmoglobinæmia have previously been reported, one of which had a suggestive family history.

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THE LANCET

LONDON: SATURDAY, MAY 28, 1938

THE TEACHING UNIT IN FACT AND FANCY

Dr. L. J. WITTS, leaving for the new Nuffield professorship in Oxford, after three years' tenure of the chair of medicine at St. Bartholomew's, contributes a valediction to the *St. Bartholomew's Hospital Journal* for May. It is neither an apology for his early departure nor a sentimental farewell, but a critical appraisal of the medical unit as he has found it, with a few pungent remarks on research in general. While the unit at Bart.'s has been, by general assent, one of the most successful of the full-time teaching units in London, Prof. WITTS's comments may be taken to apply in large measure to the others as well. He gives the units a threefold function: to care for the patients entrusted to them, to teach medical students, and to contribute to medical research, and he allows no greater importance to any one of those tasks than to another. In point of fact, he judges that the units have fulfilled the first two of those three conspicuously well; they have raised the standard of investigation and treatment of the sick and improved the education of students both directly in their own wards and indirectly throughout the hospitals to which they are attached. On that ground he defends their achievement against the general charge of "failure" which is still often brought against them. They have failed if at all in only one of their three functions, in that as a whole they have not produced much outstanding original work. The reason for that has become abundantly clear to Prof. WITTS in the last three years. The director of a unit who looks after his patients thoroughly, who teaches his students well, who "runs" an active department and gives help and training to his assistants, and who at the same time does a fair share of the committee and administrative work of his hospital, of the university, and of other medical bodies, simply has not the time or the energy or the peace of mind to carry out first-class original work himself. His whole task is vastly greater than that of a university professor in a chair of natural science, and he lacks even the temporal relief of university vacations. What is true of the professor applies in considerable measure to his deputy and his assistants; patients and students properly looked after take up so much time that what remains is too scanty, too much broken up, too inelastic to allow full scope to an original mind.

This appraisal of the medical units comes from one who knows them from inside, but who, not having been identified with them throughout his career, preserves some detachment. It seems to us to ring true. If true, it should give thought to those in whose hands the future development of the units lies. If it be granted that a unit should care for patients, and teach, and do both those things as well as they can be done, then the problem of clinical research can be dealt with in one of two ways. It can be relegated to special and independent departments, relieving the teaching units of all obligation in that direction. Such purely research departments already exist and have done excellent work. The major objection to that plan is that teaching, if taken out of the atmosphere of investigation, degenerates and becomes rigid and automatic; it turns out a competent enough doctor, well drilled in his craft, who ceases to learn any more after his first year or two of practice, and at fifty is the despair of every consultant whom he comes in contact with. The minor objection is that the isolated and specialised research institute, losing contact with general medicine, becomes a little narrow in its outlook, even a little intolerant, unwilling to accept good work that is outside its own experience. These objections can be met only by a system that allows teaching and research to go on side by side, each reacting on the other. That is not to say that they should both be done in equal parts by every member of a unit staff. It is so abundantly clear that one man can be a sound clinician and a good teacher, yet lack the inventive thoughtfulness or the mental precision necessary for good research, while another can be so alive with ideas and keen to put them to the proper test that he is impatient of the routine of treating the sick and teaching the young. The second alternative before the units is to provide within one department work and scope and salary for both those types of man. Both are extraordinarily useful members of the medical faculty, and neither should be accorded, from the nature of his task, greater prestige than the other. Both will develop in a more balanced fashion and will do their jobs better by virtue of the common atmosphere which they make and share. Young men will grow up in the department and find that their bent lies on one side of it or on the other; some of them may even alternate. More senior members of it should acquire considerable freedom to develop their own divisions as they see fit, and its chief should take counsel with them touching its general policy. His peculiar function is to choose his men well, fit them to the work that will train them best and get the best out of them, and hold the balance among them—a function that calls for a much more subtle administrative skill than that of the vigorous dictator.

Most students to-day receive their clinical teaching in medicine from honorary staffs and registrars, among whose qualifications for appointment a gift for teaching or an interest in teaching is not a first consideration. It is often suggested that for the student teaching is of secondary importance beside the first-hand experience of patients acquired in the wards. But that is not so. The example and the ideals of the teacher cannot fail to impress themselves; his enthusiasm, his

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knowledge, and his technique all enable the student to make much greater use of his ward experience than he could do unaided. The more complicated medicine becomes the more important are its teaching and its teachers, and a few nurseries where first-class teachers can be grown will do more for future generations of students than a parliament of curriculum committees. The balanced unit that we have hinted at should also develop a research worker with his feet on the ground, free from that attitude, held up to scorn by Prof. WITTS, which spells Research with a capital R and invests it with an odour of sanctity. Such a unit, of course, will require much more finance and equipment than any of the present units has at its disposal, but it is the natural development of an experiment which up till now has proved largely successful. The case for increasing the present active units to an optimum size is a strong one, and, if what we have said of the value of the unit in medical education is even approximately true, the case for establishing the unit system in all teaching hospitals is even stronger.

EFFECT OF THE NEW C.M.B. RULES

THE Midwives Act of 1936 is working smoothly. Nearly 2000 domiciliary midwives have now been appointed by local authorities as their direct full-time employees, in addition to the 4500 employed by voluntary associations under arrangement with these authorities. The status and remuneration of practising midwives being now on a par with those of health visitors, the Central Midwives Board has felt justified in imposing a far more exacting course of training on women who propose in the future to practise as midwives. For the last five years a scheme has been in preparation and the Board's new rules for the training of pupil midwives, approved by the Minister of Health a year ago, come into force this summer. By a stroke of the pen the period of training is doubled for both classes of pupil: it rises from six to twelve months for those who have had a general training in nursing and are State-registered; from twelve to twenty-four months for those who have not. For the latter the change has already taken place; for nurses the new régime begins on Sept. 2nd. This course of training is divided into two, a first part lasting six months for general trained nurses and eighteen months for others, a second period lasting six months for everyone. The examination to be taken on completion of the first period of training will be similar to the present examination, the passing of which entitles the candidate to have her name entered on the Midwives Roll. But in future the passing of the first examination will entitle the woman who is not a nurse to nothing except the right to enter on the second part of training. The trained nurse will receive a certificate from the Board which it is intended should be regarded as proof of the adequacy of her training in midwifery for all higher nursing appointments unless she is to be engaged as a midwife. The Minister of Health has accepted this Part I certificate as sufficient training in midwifery for a health visitor; hospital authorities are expected to follow suit and to regard it as sufficient for administrative posts and for charge of surgical wards even if midwifery cases are occasionally admitted. Under the 1936 Act any general trained nurse can act as a maternity nurse, and the possession of a Part I certificate confers no rights on the holder which she does not possess as a State-registered nurse. It does, however, prove that she has had a training in midwifery adequate for all purposes other than the acceptance of personal responsibility for the management of a confinement. This division of the course into two periods and the limitation of the second part to women who are intending to practise as midwives will go far to solve the problem of providing a sufficient number and variety of cases for prospective midwives and medical students.

The object then of the first period of training is to make the pupil-midwife familiar with the best methods of practice and to provide her with a sound theoretical and practical knowledge of midwifery. During this period she will have to deliver personally only 10 cases of labour, instead of 20 under the existing rules, and will not be required to undertake any domiciliary work. With a few exceptions dictated by geographical considerations this part of the training will be conducted at maternity institutions dealing with a large number and variety of cases. During the second period the pupil will be treated as a senior apprentice who, having already received a grounding in her chosen craft, is widening her experience, improving her judgment, and increasing her self-confidence and capacity to assume responsibility before she goes out as a practitioner. In the six months she will be required (for the present) to deliver at least 20 women in labour—bringing the number up to 30 altogether, to have been responsible for the nursing of 60 lying-in women and their babies (40 if she is a trained nurse), to have made at least 50 complete antenatal examinations, and had the care of 20 or more pregnant women. This will now be the minimum equipment of the midwife who is legally entitled to deal on her own responsibility with normal cases but must still summon medical help in face of any illness or abnormality during pregnancy, labour, or the lying-in. Its very completeness will serve to confirm the doubts in many minds whether the instruction of medical students in obstetrics is not often less complete.

Be that as it may, for many years there has been increasing difficulty in obtaining sufficient material, particularly on the district, for the instruction of medical students in obstetrics, and the shortage has been partly attributable to the fact that cases which otherwise would have been available for medical students were being used for the training of pupil-midwives. When the new rules of the C.M.B. come into force this cannot happen; no case which is needed for medical students will go to pupil-midwives. It will be during the second period that a pupil-midwife will do the greater part of her practical work, and will receive the whole of her district training; for the most part the institutions approved for this period are

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situated in areas away from medical schools. In the one or two cases where an institution approved for the second period is near a medical school, arrangements have been made that no district case will be used for the training of pupil-midwives within a certain radius of the medical school. Apart from a few institutions in the provinces where there is admittedly a surplus no medical school has been approved for either period of the midwife's training. Of the eight medical schools in London which train pupil-midwives at the present time, four will cease to train pupils when the new rules come into force; three have arranged with non-teaching hospitals joint schemes for the conduct of the first period of training—they will continue to take part in the training of midwives but will not allot a single delivery to a pupil-midwife. There will be an interchange between the two coöperating institutions, so that the pupils will spend three months at each. All cases of labour which the pupil is required to deliver will be attended at the associated hospital and not at the medical school. Guy's pupils for instance will have their cases at the Royal Northern, Middlesex pupils at Walthamstow, University College pupils at Battersea.

BLOOD-GROUP EXCLUSION OF PATERNITY

ON May 16th, for the first time in this country, a bench of magistrates dismissed an application under the Bastardy Acts on evidence of an exclusion of paternity by a blood-group test. The Wiltshire county magistrates, sitting at Marlborough on April 4th, spent several hours hearing conflicting evidence on an application by a domestic servant for an affiliation order against a young gardener. At the end of the day the solicitor appearing for the man asked the bench, as they were still not satisfied of the truth, to allow a blood test to be done. It will be remembered that the four Landsteiner blood groups now designated A, B, AB, and O were extended in 1928 by the discovery of two new agglutinogens M and N which define three types of blood—M, N, and MN. These types occur independently of the agglutinogens A and B. It has been amply proved that neither M nor N can appear in the blood of a child unless present in the blood of one or both parents; also that a type M parent cannot have a type N child, nor an N parent an M child whatever the type of the other parent. The applicant's solicitor agreed to the test and in due course the parties presented themselves with the child at St. Mary's Hospital, where Dr. G. Roche Lynch took blood samples.

Last week, when the case came up again, Dr. Roche Lynch said in evidence that the girl's blood group was AMN, the child's was AN, and the man's was OM. The A and O factors did not exclude paternity in this case, for the child could have inherited the A factor from its mother. But since the mating of parents of types MN and M could not have produced a child of type N, the father of this child must have been MN or N; the respondent was M. Dr. Roche Lynch handed the bench copies of a table of exclusions on the basis of the MN factors, and demonstrated how the test excluded the respondent. He admitted a human error to be possible, but stated that he had done the test personally with the coöperation of Dr. David Harley and was satisfied that he had not made a mistake. In answer to the applicant's solicitor, he said that blood-group tests, though widely used abroad for this purpose, were rarely done in this country. The solicitor for the applicant said that he proposed to accept without question the evidence that had been given. Sir Francis Burdett, the chairman of the bench, expressed his confidence that the exclusion cleared up the case and that there could be no miscarriage of justice. Dr. Roche Lynch, commenting on the value of such a conclusive test, expressed the hope that it would come into more general use in this country. The bench, though dismissing the application, decided that the applicant had had reasonable grounds for making it and therefore ought not to have costs awarded against her. The man had in any event assumed responsibility for the cost of the test.

This interesting case shows the progress which has been made in familiarising magistrates with the facts about blood-group evidence. It is significant that both the bench and the applicant's solicitor accepted the result of the test, backed by Dr. Roche Lynch's authority, without any further inquiry into its scientific basis. One reason why the test has been so little used in this country is that in the present state of the law it can only be carried out by consent. As the mother cannot benefit in any event by the result, her consent is not likely to be given if she has a substantial hope of succeeding on the other evidence. The test is not likely to be fully used until the law is altered to give magistrates discretion to order it as a condition of continuing to hear the application. Moreover, there must be some provision for paying at least part of the cost out of the public funds, for very few respondents in these cases could well afford the full cost, which would probably be between £3 and £5. The power would be essentially one to hold in reserve for difficult cases, especially as it will only exclude a proportion—about one in three—of innocent defendants. If used with discretion, however, it would be a valuable guide in many cases which at present are decided on doubtful evidence.

NATIONAL EMERGENCY INQUIRY

THE supplement to the *British Medical Journal* of May 21st gives some information about the response to the national emergency inquiry form, issued by the British Medical Association at the request of the Committee of Imperial Defence. Forms were issued to 43,560 practitioners, and the number who replied, plus the number who were not asked to complete the inquiry forms because they were already liable for service with the Territorial Army or the R.N.V.R., &c., represents a percentage of 76·19. Practitioners who stated that they were not prepared for health or other reasons to offer their services in any capacity numbered 3868, of whom 2081 were over 65 years of age.

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ANNOTATIONS

CHEMOTHERAPY FOR PNEUMOCOCCAL INFECTION

AMONG the numerous bacteria on which sulphanilamide is known to act, the pneumococcus occupies a distinct but subsidiary place. An action there is, but it is not of the same order as the action on streptococci. The evidence of it is mainly experimental, and the mere fact that there are comparatively few clinical reports on the treatment of pneumococcal infections with sulphanilamide suggests that striking therapeutic results have not often been obtained. There is no reason inherent in the nature of the pneumococcus itself why it should not be fully susceptible to chemotherapeutic measures if the right compound can be found among the numerous substances related to sulphanilamide which are now being synthesised. From evidence furnished by Dr. L. E. H. Whitby (p. 1210) it appears that such a compound has been found, and the fact that it bears the number 693 is an indication of the immense chemical field now being explored.

The substance concerned is 2-(*p*-aminobenzenesulphonamido) pyridine, and the ascertained facts are that it protects mice against large multiples of the minimum lethal dose of pneumococci, is emphatically superior in this action to sulphanilamide, and as far as results in animals are concerned, is more than sufficiently non-toxic. It also acts against experimental streptococcal infection, an exceedingly small dose being effective. Among six types of pneumococcus tested, I, VII, and VIII were the most susceptible, II, III, and V rather less so: in this respect the action of sulphanilamide is reversed, since the latter is undoubtedly more efficacious for Type III infections than Type I. There is so far no clinical evidence in confirmation of these interesting findings, but this drug will doubtless be given a trial in the clinical field, and although pneumonia occurs first to the mind as a disease in which to apply it, perhaps a still more suitable one, and certainly a more severe and critical test, would be pneumococcal meningitis. Nothing in the astonishing therapeutic achievements of the past three years has carried more conviction than the power of sulphanilamide to arrest streptococcal meningitis. If this new drug can equal this achievement in its own sphere, it will have proved its worth.

Meanwhile much remains to be done in studying it, and undue optimism may prove to be misplaced. In the review of this subject which appeared in our two last issues Prof. L. P. Garrod pointed out that sulphanilamide is the only one of these drugs which has so far been fully studied from all necessary points of view. The advent of a new compound such as this demands in the first place a tedious but fundamental study on purely pharmacological lines: the optimum concentration in the blood must be ascertained, and enough must be known about absorption and excretion for defining a scheme of dosage that will maintain this concentration. The relative insolubility of this compound—only one-tenth of that of sulphanilamide—suggests that absorption of large doses may be a difficulty and other routes of administration may have to be considered. It may or may not appear rapidly and in adequate concentration in the cerebrospinal fluid when given by the mouth; if not, it will be necessary to know whether intrathecal injection is safe. Only clinical trial will show whether it has any toxic peculiarities, since none of the many toxic effects of sulphanilamide was foretold by animal test. All these things will need to be done, not only for this compound but doubtless for others that will follow it. There is indeed much work awaiting those with the capacity and facilities for therapeutic trial of these remedies.

RADIOTHERAPY OF BRAIN TUMOURS

As judged by the results of operations, slightly less than half of all intracranial tumours may be considered benign, and in about half of these the patients afterwards lead a useful life. At a meeting of the Society of Radiotherapists on May 20th Mr. D. W. C. Northfield pointed out that benign tumours comprise not only such encapsulated ones as meningioma and acoustic neurinoma, but also certain slowly growing gliomas. The astrocytoma of the cerebellum seen in children is entirely benign and provides some of the best results of neurological surgery. Such gliomas as the spongioblastoma multiforme and the medulloblastoma are on the other hand intensely malignant, and it is most often in these hopeless cases that the neurosurgeon turns to the radiotherapist for aid. Other tumours again may be considered malignant because of their position in the brain, though histologically they are fairly benign. These include diffuse astrocytoma of the pons, of the speech centres, and of the basal ganglia; in such situations surgical extirpation is not feasible. Irradiation also proves helpful in cases of pituitary adenomas, pinealomas and arteriovenous malformations. In speaking of the choice of case for radiotherapy, and the possibility of avoiding an operation, Mr. Northfield referred to the difficulty of being certain of the diagnosis. As a rule, he said, it is advisable to precede irradiation by an operation so as to avoid the risk of leaving a benign tumour, to relieve the distressing symptoms and sequelæ of increased intracranial pressure, and to secure a histological diagnosis. Occasionally fragments of tumour sufficient for microscopical examination can be removed in the bore of a hollow needle, introduced into the suspected region of the brain through a suitably placed burr-hole, but this carries a risk of rapidly fatal hæmorrhage into the tumour. In other cases the nature of the lesion may be indicated by radiography or by angiography.

Continuing the discussion, Mrs. E. L. G. Hilton laid emphasis on the long course and spontaneous fluctuations sometimes observed with brain tumours—characteristics that make it hard to assess the value of irradiation. Although an operation, even if limited to a decompression and biopsy, may obscure the effect of radiotherapy, it provides valuable information as to the position of the tumour and its histological nature. Upon the latter Mrs. Hilton formulates her radiotherapeutic technique, which she varies according to the pathological diagnosis. A method of ensuring that the correct region of the brain is irradiated was described by the next speaker, Dr. Robert McWhirter. The location and the estimated area of the tumour are indicated diagrammatically by the neurosurgeon on radiograms of the skull in two planes, often on the ventriculograms, and with this to guide him, he makes a chart of the portals of entry and the directions of the exposures. In order to prevent unpleasant reactions that may arise when radiotherapy is begun, the initial doses are much smaller than subsequent ones. Both Mrs. Hilton and Dr. McWhirter, and those who joined in

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the discussion, were optimistic about the results of radiotherapy. Amelioration of general symptoms and improvement in the neurological status were adopted as criteria. The numbers of cases were too small for statistical survey, but all agreed about the radiosensitivity of such gliomas as medulloblastoma, spongioblastoma multiforme, and certain types of astrocytoma. A few cases of inoperable meningioma had also proved surprisingly responsive. Pituitary adenomas of both eosinophilic and chromophobe varieties had been treated with substantial success, as judged by the relief of headaches and improvement in vision and in certain of the associated endocrine disturbances. Cases of acromegaly were quoted in which this improvement had affected even the face and the extremities, so that the patients had had to be fitted with new dentures, and were enabled to wear smaller shoes.

A note of warning was sounded by Dr. McWhirter concerning the susceptibility of healthy brain tissue to irradiation. In two patients who had eventually died, post-mortem examination revealed softening of the white matter in areas of the brain in the line of treatment. Mr. J. E. A. O'Connell related similar experiences, and it is clear that this may be a limiting factor of treatment, especially in view of the present tendency to increase the dose of irradiation. The radiotherapy of brain tumours has not in fact advanced so far as radiotherapy elsewhere, and although histological proof is available that irradiation adversely affects gliomas, and the relative effects on the individual elements of the tissues composing the tumour have been analysed, many problems remain unsolved. Thus, with the medulloblastoma, there is evidence that the amount of damage resulting from irradiation is not directly proportional to the dose. Nor is there any explanation why individual tumours of similar histology, such as different examples of spongioblastoma multiforme, should show unequal response to treatment. Moreover, although irradiation may cause retrogression of a brain tumour, the ultimate goal is permanent cure. But if, with our present meagre knowledge and empirical methods, a portion of a tumour can be destroyed, there is surely reason to think that a technique will ultimately be evolved that will cause complete dissolution of the tumour. To encourage research an adequate number of beds should be allocated to the radiotherapist, and this is becoming increasingly urgent, since the courses of treatment now being practised in many clinics may last as long as eight weeks.

INFLUENCE OF DIGITALIS ON ANGINA

DIGITALIS is not called for in angina of effort, and when given it sometimes seems to have an adverse effect. Since the heart is not dilated in this condition one cannot expect digitalis to increase the contractile power of the myocardium, which indeed is usually unimpaired. The drug might, however, alter the coronary flow either by a direct action on the vessel wall, or by an alteration in the muscle tone, which is known to influence the coronary flow in perfusion experiments. Some experiments have made it look as though digitalis constricts the coronary arteries, but a possible source of confusion here is the functional condition of the heart, the effect differing according to whether the heart is dilated or not. Clinically, though it is notoriously difficult to assess the value of drugs on the course of angina, Gold and his colleagues [1] have tried to determine the action of digitalis in an experiment on 120 patients with effort angina and no congestion. The observations lasted a long time, for alternate periods of treatment with digitalis and with a placebo covered many weeks, or even months; likewise the dose of digitalis used was adequate, for this was gradually increased to 9 grains of dried leaf daily, unless toxic symptoms appeared. Full precautions were taken to prevent the patient knowing what drug he was taking, and if a single course of digitalis had an apparent influence on the pain a second or repeated courses were given later, the colour and taste of the preparation being changed. In 30 per cent. of the patients the pain seemed to be lessened in frequency or severity by digitalis; in 15 per cent. it was increased. These alterations, however, were not uniform in the same patient when the test was repeated, and similar results were noted from the use of a placebo. So far as these tests go, therefore, it appears that digitalis is without effect, either good or bad, on angina of effort.

[1] Gold, H., Otto, H., Kwit, W. T., and Satchwell, H., *J. Amer. med. Ass.* March 19th, 1938, p. 859.

NEW TESTS OF SCIENTIFIC TRUTH

IT was formerly believed that science knew no barriers. The pursuit of truth was along an international highway that crossed all national frontiers, and the traveller needed neither passport nor visa. Each country appreciated the characteristic contributions of the others and all new facts were welcome, whatever their origin, provided only that they enlarged man's knowledge of himself and the world around him. But times have changed, and we are faced with a new criterion of truth—namely, usefulness to a political régime. In raising economic barriers and other aids to self-sufficiency nationalism has now raised cultural barriers also. Hence we have become familiar again with the purging of libraries, and with bonfires of books; and we must not be surprised that the *Münchener medizinische Wochenschrift* should give pride of place to a paper [1] proposing to get rid of those parts of psychopathology that have been contributed by Jews. The author, Dr. Karl Hannemann, surveys the contributions of Germans and others to this latest, though most antique, branch of medicine; but he does so with the object of exalting the Nordic view of the world and consequently the Nordic view of what right-mindedness should be. Inasmuch as Germans are now taught that their misfortunes have been caused by aliens in their midst, and that the Nordic outlook is essentially right, it becomes natural that all influences not of their own racial origin must be defective and misleading. In the rebuilding of Germany the Nordic men of science have been coöpted by the political machine to cultivate a Weltanschauung which, in Hannemann's own words, "shall be taught in the universities because of and for the lasting maintenance of the new soldierly discipline of our people." Analytical psychology of all kinds, Freudian, Adlerian, and Jungian, is subversive of this national aim. As analysis it destroys the soul without discovering it. The Jews in particular, Freud and Adler, give to psychotherapy a Jewish slant; they poison first in order to depoison in their fashion. Jung, too, corrupts the youthful spirit of Germany, for although he rightly contemplates the racial differences of the unconscious, he has introduced an oriental mystical occultism. The Jews remain the great enemies of German psychotherapy. What is right in Freud is derived from the Nordics; what is false in his views (according to Prinzhorn and Bumke) is the result of the

[1] Hannemann, K., *Münch. med. Wschr.* May 6th, 1938, p. 657.

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Talmudic dialectic. We look forward with interest, though with some concern, to the International Congress of Psychotherapy when some of our German colleagues will meet us in the serener air of Oxford.

Dr. Eduard Pernkopf, kommissarischer Dekan of the faculty of medicine, in the first anatomical address [2] given at the University of Vienna since the Anschluss, also deprecates the alien influence which till lately dominated science in his country and wrapped it in speculative imaginings till it no longer bore the imprint of the character of the people. If it is once more to become "German" in the truest sense of the word the limits of understanding must be frankly admitted and science must "not only be true but also clear as a spring of pure knowledge." Under the new order of things so-called freedom will be impossible; indeed Dr. Pernkopf considered it would be undesirable, for science should develop according to an ordered plan and strive towards a definite goal. It is no longer, he said, to be a question of science for the sake of science—but science as part of life must be made to serve life, and as guardian of the race the doctor will hold an important place in the new ideology.

SECRET REMEDIES

WHEN any reform is demanded as urgently as in the report of the Select Committee on Patent Medicines in 1914, something really ought to be done about it. In the latest sixpenny monograph in the "Fact" series (19, Garrick-street, London, W.C.2) Prof. A. J. Clark of Edinburgh University takes up this task afresh. He sets out the scandalous shortcomings of the existing laws. As the 1914 report revealed, anybody in this country can procure a drug or make a mixture, whether potent or powerless, advertise it as a cure for any ailment, recommend it by bogus testimonials or by the facsimile signatures of fictitious physicians, and sell it under any name he chooses, on payment of a small stamp duty, for any price he can persuade a credulous public to pay. The obstacles are few. He cannot traffic in a scheduled poison or in any of the drugs within the Dangerous Drugs Acts. In 1917 Parliament singled out the treatment of venereal disease for exceptional restriction. Otherwise the field remains as wide as when the Select Committee surveyed it nearly 25 years ago. Indeed the position has probably become worse because the public, while remaining ignorant of therapeutic and dietetic values, has become more health-conscious and, having now acquired the benefits of elementary education, is more susceptible to the persuasion of advertisement by way of poster or newspaper. In the eighteenth century, says Prof. Clark, a bottle of oil could be advertised as a cure for scurvy, leprosy, and consumption. To-day the modern advertiser would declare it to be rich in all the vitamins and the elements essential for life and would limit his claims to a statement that it will alleviate all minor ailments. Not that there are no advertisements of remedies for major illnesses. In 1936 the Medical and Surgical Appliances (Advertisement) Bill proposed to prohibit the advertising of cures for blindness, Bright's disease, cancer, consumption, epilepsy, fits, and so on. Just as the 1914 report escaped due notice because of the preoccupation of the country with Armageddon, so the 1936 Bill was unlucky in coming up for second reading on a day when our legislators were distracted by the Grand National. The House of Commons was counted out and the chance was lost to abolish the exploitation of fear. The Government is perhaps the more complacent because it levies taxation on proprietary medicines. It is indeed in some degree an accomplice, since the medicine stamp duties give a kind of official recognition. It has shown commendable interest in the improvement of the national physique. One simple step in this direction would be the institution of some measure of control of secret remedies.

Three essential reforms were propounded by the 1914 Committee—first, the registration of manufacturers, proprietors, and importers of patent, secret, and proprietary remedies; secondly, the disclosure of the ingredients of these remedies with a full statement of the therapeutic claims made or to be made; and thirdly, the control of advertisements. Prof. Clark's little book most usefully shows the growing necessity for such measures as these. His reference to the recent draft of a Food and Drugs Bill as containing provisions which may check fraudulent advertisement of proprietary remedies is probably too optimistic. The Bill does little more than re-state old statutes. The Committee which produced it confessed that their task was not to frame ideal legislation but to reproduce existing laws with merely so much amendment as was likely to command general assent. The Bill thus reproduces the 1928 Act which (like the older Act of 1875) penalises the sale of food or drugs not of the nature, substance, or quality demanded. The Bill leaves untouched the exemption for a proprietary medicine if "supplied in response to a demand for medicine." The chief amendment proposed by the Bill is in a clause which hopes to check misleading advertisements by penalising false and misleading labels on the wrappers and containers of food and drugs and by treating the advertisements (which probably had more influence than the label in inducing the sale) as if they were labels. It must be realised that the Food and Drugs Bill, now being examined by a Parliamentary Committee, is not going to contain anything controversial. It is therefore not the appropriate vehicle for the reforms which are required in order to protect the public from the mischiefs of secret remedies. Those reforms are urgently necessary. Perhaps Prof. Clark's exposition will stimulate official action.

NASAL SINUSITIS AND MENTAL DISORDER

SOME psychiatrists think that focal infection plays a large part in causing and increasing mental illness. Dr. T. C. Graves contributed a paper to these columns some years ago [1] in which he claimed good results from non-specific shock therapy, and in a monograph [2] appearing soon afterwards he said that of 1000 cases of mental disorder no less than 818 showed evidence of nasal sinus infection. Dr. A. B. Smith and Dr. C. M. Ross, who have studied 818 unselected cases in a mental hospital, produce strikingly different findings.[3] There were 23 cases in which the sinuses could not be examined with X rays, but in which there was no reason to suspect sinus disease. Of the remaining 795 cases, 63 showed definite evidence of nasal sinusitis, but 624 could be definitely regarded as free from sinus disease, while in the other 108 the presence of nasal sinus disease was doubtful. Thus of the 795 cases 7·9 per cent. had definite sinusitis and in 13·6 per cent. the diagnosis was inconclusive. Smith and Ross hold it probable that 32 out of the 108 doubtful cases had

[2] *Wien. klin. Wschr.* May 20th, 1938, p. 545.

[1] *Lancet*, 1932, 2, 57, 115.
[2] *J. ment. Sci.* 1932, 78, 459.
[3] *Edinb. med. J.* May, 1938, p. 343.

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sinusitis, and this would give a total figure of 11·9 per cent. in the entire series. The methods employed were similar to those used in the ear, nose, and throat department of the Edinburgh Royal Infirmary, and diagnosis rested on the presence of muco-pus or pus in the washout of a suspected sinus, or on radioscopic examination. It is concluded that nasal sinusitis has no real ætiological significance in any of the main groups of mental disease, except for the theoretical possibility of a sinus infection producing a toxic confusional state, and in fact no such case was encountered in the 818 examined. The highest proportional incidence was found in the manic-depressive group, and may, they say, be correlated with the lowered physical vitality so often seen in these cases. The opinion reached is that mental patients in general do not stand to gain by treatment directed towards their nasal accessory sinuses. Smith and Ross admit that these 818 showed more sinusitis than would be expected in 818 members of the general population, but this they think may perhaps be explained by neglect of nasal hygiene during mental illness and by the overcrowding of many mental hospitals.

DOCTOR TO DOCTOR

A LETTER about a patient, written confidentially by one doctor to another upon a question of diagnosis or treatment, ought to be as absolutely privileged as correspondence passing between solicitor and counsel about a client. It comes as a shock to find that such a letter was made public in the disciplinary atmosphere of a health insurance subcommittee's proceedings. The patient in the case had been struck in the back by a bicycle. He afterwards collapsed at his work and had to be taken home. He was seen by Dr. A, who was acting as deputy for his partner Dr. B, Dr. B being the man's panel doctor. Dr. A suggested that the patient should attend at the local infirmary. He gave him a sealed envelope addressed to the infirmary doctor. Inside the envelope was a letter which contained the following passage: "Do you think that this man is soft? simple? ill? I have been called to him twice lately and have never been satisfied that he has been really ill. . . . I personally think he is a bit soft and has no 'guts.' I shall be glad of your opinion." The envelope was never delivered. The patient was too ill to get out of bed next day, and he died nine days later. On the day of the funeral the widow opened the letter which was intended for the infirmary doctor. The matter came before the medical service subcommittee on her complaint and the letter was included in the subcommittee's report. At the subcommittee's inquiry Dr. B, who had attended the patient after he became very ill, stated that he did not think the accident had any bearing on the death; the man was of a neurotic type; death was due to heart failure which had developed in the last few days before he died. No complaint was made against Dr. B, but the subcommittee recommended that the Minister of Health should withhold a sum from Dr. B's remuneration because Dr. A, his deputy, had failed to exercise reasonable skill and care. When the subcommittee's report came before the Lancashire insurance committee last week, the chairman of the latter body protested against the inclusion of the private letter in the report.

It may be hoped that this protest will be vigorously sustained. Two practitioners, engaged in the treatment of a patient, must be allowed the frankest consultation. Of the details on which the allegation of default on the part of Dr. A was based, no information is at present available. In so far as the private letter forms part of them, it is no basis at all. Dr. A is presumably being censured not because he wrote a letter which was perfectly proper as between one doctor and another, but because the letter was opened by someone for whom it was never intended. Many communications must be made confidentially in the course of professional consultation which might, if subsequently disclosed to the parties or their relatives, sound harsh and unsympathetic. This must be true of professional practice in other fields besides medicine and surgery. The spoken word may run less risk of misunderstanding than the written word which remains on record. But speech is not always practicable. It is, of course, in the interests of the patients or clients that this professional privilege is essential, not in the interests of the practitioners.

TECHNIQUE OF WASSERMANN AND FLOCCULATION TESTS

A CLINICIAN asked to say what he knows about the Wassermann test for syphilis would probably say that it depends upon the fact that a syphilitic serum fixes complement in the presence of a suitable antigen and that sensitised red cells are used as the indicator of the presence of any unfixed complement. Of the details of the technique for carrying out the reaction he would probably confess to knowing very little, and of the many pitfalls which have to be avoided and of the intricate mechanism of the test almost nothing. Such ignorance matters little, provided the work of interpretation is entrusted to a reliable serologist whose reports can be understood by the clinician, and that the latter is able to collate the information received with the clinical condition of the patient. It has become important for practitioners to know something of the interpretation of quantitative tests, doubtful reactions, anticomplementary serum reactions, and, above all, of the spinal fluid findings, and unfortunately many of them ignore the significance of such things. Even the extent to which the Wassermann and flocculation tests give comparable results is a matter to which clinicians have given little attention. According to Dr. Harry Eagle, who has gone fully [1] into the physico-chemical basis of the two types of reaction, they involve the same phenomenon, namely, the combination of reagin-globulin with the lipoid particles of the antigen and the flocculation of the compound; the same reagin determines both complement fixation and precipitation. He does not explain how it is that one comes across sera which give a positive Wassermann reaction yet a negative flocculation test.

Not only practising physicians, but serologists will find Dr. Eagle's informed comments valuable, though they may turn to different sections of his work. The former will find in chapters VI, VII, and IX an account of the mechanism of the Wassermann and flocculation tests, and in chapters XVI to XXII opinions on their clinical evaluation which will lead to a revision of many of his preconceived ideas. The serologist will note the criticisms of the conclusions reached at the serological conferences held under the auspices of the League of Nations Health Organisation in 1923, 1928, and 1930, and Dr. Eagle's view that the outcome of two subsequent serological studies and conferences carried out under the auspices

[1] The Laboratory Diagnosis of Syphilis. By Harry Eagle, M.D., passed Assistant Surgeon, United States Public Health Service, Washington, D.C.; Lecturer in Medicine, Johns Hopkins University Medical School, Baltimore; formerly Assistant Professor of Bacteriology, University of Pennsylvania Medical School. London: Henry Kimpton. 1937. Pp. 440. 21s.

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of the U.S. Public Health Service and the American Society of Clinical Pathologists (1934–35) was no happier. The Wassermann techniques employed in these studies yielded widely discrepant results and in only three of nine flocculation tests under investigation were the results reliable enough to warrant further trial.

It has long been known that even in the hands of experts the results obtained with all these tests vary widely. Dr. Eagle, having justified by comparative figures his contention that the diagnostic tests as now performed in many laboratories are inadequate, is not without constructive suggestions. One is the refinement of the tests, though he admits that their sensitivity can be little, if at all, increased beyond the level already attained—well over 95 per cent. positive reactions in untreated syphilitic patients—in some of the newer flocculation methods or in an ice-box Wassermann reaction with a highly sensitised antigen. Improvement could still be effected in the provision of a wider margin of safety in the preparation and adjustment of the reagents and in minimising the personal element of interpretation in reading the results. More important, however, is his plea for a more critical attitude on the part of the individual laboratory to the calibre of its own performance. In some laboratories "outmoded" procedures, such as water-bath fixation, are employed; in others poor results are obtained, even with an approved technique, owing to an insufficiently trained personnel. Dr. Eagle regards ice-box fixation as essential for the satisfactory performance of the Wassermann test; in this country most laboratories use the method, recommended in a report to the Medical Research Council in 1929 by E. J. Wyler,[2] of fixation for half an hour at room temperature followed by half an hour in the water-bath at 37° C.

A serological report on a patient with suspected syphilis, whether before, during, or after treatment may have such a profound effect on the health and happiness that questions of technique should not be left unsettled. Another conference to evaluate the newer modifications of the complement-fixation and flocculation tests is surely overdue. Methods will have to be discussed afresh, after an unbiased survey of recent advances; and the routine laboratories adopting the one recommended should at least have opportunity of checking their technique from time to time with that practised in a reliable control laboratory. Some would go further and maintain that laboratories where Wassermann and similar tests are performed should be subject to periodical inspection by an expert.

A DUAL RADIOLOGICAL FELLOWSHIP

AT its recent meeting in Belfast the British Association of Radiologists came to a decision that should do much to improve the status of radiologists. When the Association was founded four years ago foundation members were admitted to the fellowship by thesis, but it was not long before examinations were established, and the first of these was held last year. The next step was to recognise that radiology has two distinct branches—therapy and diagnosis—and it was originally proposed that candidates for the fellowship should take examinations in both subjects and reach an honours standard in one of them. This plan, however, has now been abandoned, and there will henceforth be separate examinations in radiotherapy and in radiodiagnosis, success in either of which will confer the title of fellow. Both examinations will include sections on medicine, surgery, and pathology, and it is hoped that bodies granting higher qualifications in these subjects will coöperate by appointing associate examiners. Candidates who already hold such higher qualifications will be exempt from the relevant part of the examination, but must possess a diploma in radiology and must present a thesis on some aspect of either diagnosis or therapy.

One beneficial effect of a special examination in radiotherapy should be to facilitate the choice by hospital authorities of medical officers competent to take charge of this department and to control the use of the radium provided by the Radium Commission. In their last report the Commission commented on the difficulty of obtaining well-trained radiotherapists, and made various suggestions for improvement in their status. It is now generally agreed that X ray and radium therapy cannot be divorced, and that a full knowledge of both, as well as of the physics of irradiation, is needed by those who undertake responsibility for the treatment of patients by such potent agents. But the most important side of the radiotherapist's work is clinical, and extensive experience, particularly in the treatment of malignant disease, is also essential if this work is to be done well. Such experience can be obtained only in special hospitals, or in large general ones where cases treated by these methods amount to many hundreds in a year. The radiotherapist of the future, after obtaining a diploma in radiology, will clearly have to embark on a course of training as exacting as that required for any other specialty. If he then passes an examination of a standard high enough to ensure theoretical as well as practical competence he will be entitled to a status equal to that of any member of the staff, though the nature of his work demands a full-time appointment on a salaried basis.

TROPIC OR TROPHIC?

SOME of those who read the note by Dr. van Wagenen and Dr. Morse appearing on p. 1220 will dismiss its opening word, *gonadotrophic*, as a printer's error. But they will be wrong; for the form that yesterday was only a commonplace spelling mistake bids fair to prevail to-morrow. In a book published last year Prof. Burn[1] contended that in endocrinological usage the termination *tropic* is less suitable than *trophic* and recommended that henceforth *gonadotrophic*, *thyrotrophic*, *adrenotrophic*, &c., should replace the current form. *Tropic* means "turning towards," whereas *trophic* means "nourishing"; and ultimately it must be left to biologists to decide which of these more accurately describes the action of a hormone. In favour of the change it is argued that the thyroid-stimulating hormone, for example, does not turn towards the thyroid any more than it turns towards all the other glands and tissues; but when, on its travels round the circulation, it reaches the thyroid it proceeds to nourish that particular gland in some way necessary to its growth—excess or deficiency of such nourishment making it *hypertrophic* or *hypotrophic*. The conception of a *thyrotropic* hormone is, moreover, inconsistent with the familiar conception of *geotropic* or *heliotropic* growth by plants; for it is the hormone that turns to the gland, not the gland to the hormone. Some oppose the alteration on the ground that better terms will have to be devised when more is known about these substances; but as an interim improvement it is

[2] *Spec. Rep. Ser. med. Res. Coun., Lond.* 1929, No. 129.

[1] Burn, J. H., Biological Standardisation, Oxford, 1937.

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commended by Dr. Parkes[2] of the National Institute for Medical Research. He also proposes that *gynæcogenic* (rather than the specialised *œstrogenic*) should be used as a general term for activity that promotes the attributes of femaleness, and that *ambisexual* should be preferred to *bisexual* where activities pertain to both sexes.

TEETHING

THE disturbances associated with dentition in young children are still imperfectly understood. They have been made to cover a multitude of symptoms, and it is a grim jest at many children's hospitals that even cases of tuberculous meningitis are sent in with a diagnosis of "teething." The result is that most experienced pædiatricians are very reluctant to attribute ill health to dentition. Dr. Robert Paschke[3] nevertheless finds it hard to accept the current view that dentition is a physiological process and hence incapable of causing disease; it is unreasonable, he thinks, to insist on attributing teething troubles to rickets or a neuropathic tendency or "hypersensitivity." From dental experts he has ascertained that the final stages of the growth of the tooth necessitate a destruction, by the enlarging "crown," of the soft parts which lie between the tooth-sac and the gum margin. At the time when this stage is reached—some 8–21 days before the actual appearance of the tooth in the gum—a destructive necrosis takes place and the dying tissue is especially liable to secondary bacterial infection by organisms present in the mouth. Whether this infection materialises is, according to Paschke, a more or less chance affair, and does not depend on the state of health or on any underlying diathesis or tendency. He estimates that about 10 per cent. of all small children are affected by this "septic" complication, although he points out that medical aid is sought for in only half of them. In support of this hypothesis the symptoms due to teething are those that might be expected from the absorption of toxins from a septic focus—namely, fever, loss of appetite, restlessness, pain in the gums, various degrees of inflammation of the upper and often the lower respiratory tracts, otitis, and disturbances of the alimentary tract. Rashes about the face and ears are also common. In severe cases the child suffers from high fever, vomiting, and even convulsions, lying in bed with glassy eyes and all the signs of a severe systemic toxæmia, though remarkably little can be found to account for it, even on inspection of the mouth. The eventual appearance of the teeth through the gums, after an interval of 1–3 weeks, is as a rule quietly accomplished.

Paschke unrepentantly accepts a disorder which he names "tooth fever," and his views seem to have a background of solid fact.

INGENUITY IN EXCELSIS

EVERY year the Royal Society enlivens its conversazione with an exhibition of scientific mechanisms and marvels. Whatever effect this may have on the Society's own fellows it certainly makes for modesty in the visitor; for even the courteous explanations offered by the custodians are apt to leave him incompletely informed about (for example) order-disorder transformation in alloys, the shield grid thyratron tube, and the storage principle in the emitron. Last week it must have been a relief to many to turn at times to the superficially simpler objects—the collection of stuffed mammals illustrating prehensile tails, the well-preserved wooden piles that once supported Waterloo Bridge, and the fascinating bevy of echinoderms carried alive from Plymouth to join in the evening's fun. From the borderland of medicine Dr. F. Himmelweit and Mr. J. Smiles had brought an equally live and much more lively group of virus bodies visible at a high magnification in cells of the chorio-allantoic membrane of the chick, and Mr. J. E. Barnard, F.R.S., of the National Institute for Medical Research, showed apparatus in which ultra-violet energy of a single wave-length 253 μ is used as an illuminant when material thought to contain viruses is examined microscopically. In the higher vegetable creation pots of plants were arrayed to illustrate how the colour of the garden hybrid, streptocarpus, depends on structural differences in the anthocyanin molecule inherited as simple mendelian factors. More immediately important perhaps were an apparatus for continuously recording gaseous exchange in expired air (designed by Prof. Rein of Göttingen and shown by Dr. A. Schott), a demonstration of the manufacture of cyclopropane and its application as an anæsthetic (Imperial Chemical Industries), and new means of sampling industrial dusts (Prof. H. V. A. Briscoe). Mr. G. W. C. Kaye, D.Sc., and Mr. J. E. R. Constable, Ph.D., of the National Physical Laboratory showed how the wave form and spectrum of sounds can be continuously observed, and the Cambridge Psychological Laboratory displayed tests devised for examining sensory thresholds and the effect of memory on performance. A film illustrating the growth of roots was shown by Prof. E. J. Salisbury, F.R.S.

SILICOSIS AS A BIOLOGICAL PROBLEM

THE problem of silicosis, like many others in which complex physical and chemical, as well as pathological factors are involved, becomes more perplexing the more it is studied from these several angles. There has been a tendency in recent years to use the difference in the solubility of silica and the silicate under experimental conditions as an argument supporting this or that theory of its ætiology, and this or that practice, in the attempts constantly being made to reduce its incidence. Mr. E. J. King, Ph.D., sets out briefly on another page what is known of the solubility of silica. A much more extensive survey of the physiological and pathological aspects of silica, contributed jointly by Dr. King and Dr. T. H. Belt, will shortly appear in *Physiological Reviews*.

A Select Committee of the House of Lords rejected on Tuesday the Bill promoted by the governors of St. Bartholomew's Hospital to secure power to use the general funds of the hospital for the provision of a paying patients' department.

To medical men in all countries the name of Prof. GEORGES MARINESCU was familiar for his contributions to neurology, and his death on May 15th, at the age of 75, removes a truly international figure. He was appointed to the Salpêtrière in Paris in 1889 and worked on epilepsy in Charcot's clinic. From there he went to Frankfurt as assistant to Weigert, and later to Berlin. Returning to Bucharest, to the chair of nervous diseases, he continued to investigate the histology of the nervous system, its degenerative diseases, and its physiology. His eminence as research worker and clinician led to the publication of a book on his life and work, to which contributions were made by neurologists of many countries, with a foreword by Ramon y Cajal.

[2] Parkes, A. S., Sc.D., F.R.S., *Nature*, Lond. 1938, 141, 36.
[3] *Münch. med. Wschr.* 1938, 85, 52.

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SPECIAL ARTICLES

THE SOLUBILITY OF SILICA

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FOR several years the pathogenicity of silica in its relation to silicosis has been widely held to depend on its solubility. Older theories had envisaged a sort of microscopic trauma, due to the sharpness of the particles. But following the demonstration by Kettle (1932) that the coating with iron of powdered silica rendered it innocuous and the failure of Gardner (1923) to produce lung fibrosis with powdered carborundum, this so-called "mechanical theory" of silicosis was largely abandoned. A body of evidence has accumulated which seems to indicate that silica in solution has a poisonous action on the tissues (cf. Gye and Purdy 1922, Gye and Kettle 1922, Gye and Purdy 1924). If the toxic action of silica dusts be due to their solution, then the particles in a silicotic lung must dissolve—to some extent at least—in tissue fluids.

Sosman (1927) in his well-known monograph on silica and silicates has said that from the standpoint of the industrial chemist silica is about the last thing on earth which could be expected to be harmful in the body. Its inertness is a matter of common knowledge and in its crystalline forms, such as quartz, it is usually thought of as being one of the most highly insoluble of substances. This current belief in the insolubility of silica does not, however, stand the test of experiment. It is true that if water is kept in a quartz vessel no silica can be demonstrated to have passed into solution from the walls of the vessel, but if the quartz be reduced to a very fine powder and then suspended in water, the presence of significant amounts of silica in solution can be demonstrated.

Many of the older results recorded, which were claimed to indicate the solubility of quartz in water, are, it is true, of little value. They were obtained at a time when workers had no adequate means of separating the very finely divided particles of their quartz powder from the solution. The filtrates on which they determined solubility contained not only dissolved silica but suspended particulate matter. For this reason the early results on the solubility of silica (e.g., Struckmann 1855) do not provide a proper measure of the dissolved silica. Lehner and Merrill (1917) were aware of this difficulty, but did not have the means to overcome it in their solubility studies.

With the introduction of modern methods however any difficulties in the way of determining the solubility of silica and silicate dust have been removed. The ultra-centrifuge and the ultra-filter have made it possible to obtain true solutions completely separated from the suspended solid material (King and McGeorge 1938, Titus 1937) and the utilisation of chemical reactions, into which only the molecularly dispersed silicic acid will enter, has furnished a further means of measuring the true amount of the dissolved silica.

In water and biological fluids most of the reported figures for the solubility of quartz vary between 4 and 14 mg. SiO_2 per 100 c.cm. Several results from the work of recent investigators are set out below in tabular form. The considerable variation in the figures shown is probably due to the fact that the several authors have used dusts of different particle size, different concentrations of suspended solid, and perhaps different methods of separating the solid from the liquid phase in the estimation of the dissolved silica. Small amounts of impurities in the mineral dusts likewise influence the degree of solution. This factor is, of course, particularly important in solubility studies with distilled water. It is not so important in the case of biological fluids which already contain as known constituents appreciable amounts of the substances, such as calcium, which may influence to a marked extent solubility of quartz in distilled water.

SOLUBILITY VALUES FOR SILICA AND SILICATE DUSTS

	Mg. SiO_2/100 c.cm.		Liquid.
Amorphous silica ..	10·0	....	Water.[1]
" " ..	14·0	....	Pleural fluid.[1]
" " ..	9·0	....	Blood-serum.[4]
" " ..	9·1	....	Ascitic fluid.[4]
Quartz	4·3	....	Water.[1]
"	3·8	....	Water.[2]
"	2·7	....	Water.[3]
"	19·0	....	1% $NaHCO_3$.[5]
"	9·1	....	Ascitic fluid.[4]
"	8·9	....	Blood-serum.[4]
Flint	14·7	....	Water.[3]
"	6·5	....	Ascitic fluid.[4]
Granite	0·7	....	Water.[3]
"	5·0	....	1% $NaHCO_3$.[5]
Asbestos	11·2	....	Water.[2]
"	2·1	....	Water.[3]
Fuller's earth	1·4	....	Ascitic fluid.[4]
Kaolin	0·7	....	Water.[3]
	0·4	....	Ascitic fluid.[4]
Sericite	0·7	....	Water.[3]
"	0·8	....	Ascitic fluid.[4]
Talc	0·8	....	Ascitic fluid.[4]

[1] Archer (1932); [2] Briscoe et al. (1937); [3] Denny et al. (1937); [4] King and McGeorge (1938); [5] Whitehouse (1937).

SOLUBILITY-DEPRESSION PHENOMENA

The substances which affect the solubility of silica fall into two classes: (1) substances like coal which appear to depress solubility because they adsorb the dissolved silica, and (2) certain metals and their oxides. The latter are characteristically those which form insoluble silicates, and it is probable that the solubility-depression phenomenon is due simply to precipitation of the silicic acid, as fast as it appears in solution, as the insoluble silicate. This precipitation takes place most readily in the presence of an excess of the finely divided metal or metallic oxide.

The effect is particularly well seen with *lime*. Minute amounts of calcium hydroxide enhance the solubility of quartz, but large amounts almost completely depress it. Lime is not very soluble in water, but it is soluble enough to give a solution which is centinormal in alkalinity and has a *p*H of about 12. In this alkaline medium silicic acid is completely precipitated as calcium silicate, and hence silica shows almost no solubility in lime water. Calcium carbonate, being a much weaker alkali and much less soluble than calcium hydroxide, might be expected to have little if any depressing effect on silica solubility and this is indeed the case. Bubbling CO_2 into a lime water suspension of silica restores the solubility of the silica from almost nothing to very nearly the figure for silica solubility in water. The CO_2 has simply changed all the calcium hydroxide into carbonate, and precipitated a lot of it in the process.

That calcium carbonate may even increase the solubility of silica in water was shown many years ago by Dienert and Wandenbulche (1923) who found that the river waters of France which flowed through granite formations picked up much more silica in solution if they had previously flowed through a limestone area. More recently Denny et al. (1937)

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have shown that the solubility of a very pure silica sand (99·6 per cent. SiO_2) could be increased from 3·8 to 12·3 parts per million by the inclusion of only 0·5 per cent. $CaCO_3$.

It would be rash to speculate on these solubility relationships of silica with limestone in connexion with the occurrence of silicosis in trades, such as cement manufacturing, which carry an exposure to both silica and lime dust. But it must be remembered that while silicosis has a lower incidence in the cement industry than in those having a hazard of purely siliceous dust, the popular notion that cement workers never get silicosis rests on no sure foundation. Not infrequently clinicians and pathologists encounter lungs of cement workers showing changes characteristic of silicosis and tuberculosis (cf. Belt 1929, Russell 1933). A large proportion of the dust in these lungs, and in the air breathed by the workers in cement factories is non-siliceous, and Sayers and Jones (1938) hold to the belief "that the absence of evidence of extensive pulmonary fibrosis among employees in the cement industry is due to the fact that there is insufficient total exposure to free silica (considering concentration of dust and duration of exposure) rather than that there is any neutralising effect due to the calcium."

Metallic *aluminium* is a particularly efficient depressor of silica solubility. By the inclusion of 1 per cent. of finely divided aluminium in their powdered quartz Denny et al. (1937) were able to reduce the solubility almost to nothing. Acting on the "silica solubility" theory of silicosis these workers exposed animals to an atmosphere containing quartz dust in one group and quartz dust with aluminium in another. In contrast with the fibrotic response observed in the silica group was the almost complete absence of any fibrosis in the lungs of the silica + aluminium group. Only a preliminary account of this work has so far appeared.

J. S. Haldane was for many years the leading exponent of stone dusting as a measure designed to decrease the silicosis hazard of highly siliceous dusts. For this purpose he advocated the use of powdered *shale*, a material which long experience had shown to be a non-dangerous dust. It was Dr. Haldane's belief that shale dust acted not merely as a diluent of the dangerous dust, but that it actually antagonised the effects in the lung of the free silica. The interesting experiments of Whitehouse (1938) on the effect of various stone dusts on the solubility of flint and quartz now demonstrate a distinctly depressing effect on silica solubility of finely powdered shale and gypsum. Many samples of different shales behaved similarly in exhibiting this phenomenon of a 40 to 60 per cent. depression of the solubility of quartz. A similar effect was shown with several coal dusts, and Whitehouse recalls in this connexion the repeated observation of Haldane that "silica dust is apparently rendered harmless if breathed with a sufficiency of certain inert dusts such as coal dust."

Last year attention was drawn to the possibility that freshly fractured minerals exhibit special properties due to their newly formed particle faces (Denny et al. 1937, Briscoe et al. 1937). The suggestion is that the rate at which silicic acid would dissolve from such particles would be greater than the rate in "stale" dusts which have been prepared for some time, and whose particle faces have lost their active properties. The finding of a higher solubility in freshly prepared dust led Denny, Robson, and Irwin (1937) to their experimental work on the production of nodular fibrosis in rabbits with freshly forming dusts (see *Lancet*, 1937, 2, 271). Whether or not this fibrosis is a true silicosis has yet to be established.

EXCRETION OF SILICA

The solution of silica in the lungs should result in the passing of silicic acid into the blood, followed by its excretion in the urine. Several studies have been made in recent years of the silica excreted in the urine of miners and other people exposed to the inhalation of siliceous dusts. King and Dolan (1934) found the average silica excretion to be higher amongst a group of gold miners than in a normal mining population, and Bloomfield, Sayers, and Goldman (1935) claimed to show a relationship between the amounts of silica in the urine of miners and their silica dust exposures. Whitehouse (1937) described experiments in which he swallowed samples of powdered rock. Small increases in the silica excreted in his urine occurred after the taking of very finely powdered flint dust and of Scotch whinstone, a rock of mixed silicates. Other minerals gave negative results. With relatively much larger samples of mineral dusts King and McGeorge (1938) have shown that several other minerals are dissolved to an appreciable extent in the gut and are excreted in the urine of cats. They likewise studied the excretion of silica following the intraperitoneal injection of powdered minerals. An appreciable solution seemed to take place in the case of most of the forms of free silica (e.g., amorphous silica, quartz, flint). In the case of the combined forms of silica—the mineral silicates—only very small increases were observed.

It seems unlikely, on the basis of the data which have thus far appeared, that any useful results can be obtained from studying the excretion of silica in the urine of miners and other workers exposed to a dust hazard. It is probable that only a small proportion of the total silicate in the urine comes from the lungs. The silica of the diet readily causes variations in the urinary silica, and the food of industrial workers exposed to silica dust inhalation would have to be very rigidly controlled before any significant changes due to silica solution in the lungs could be looked for. More profitable may be the comparisons of solubilities in vitro and the excretion following the administration of massive doses to animals, with dusts constituting known industrial hazards. Recent results obtained by King and McGeorge (1938) indicate that the different varieties of free silica which, with the exception of asbestos, are the only well-authenticated cases of silicosis producing industrial dusts, are those which are most soluble in body fluids and which seem to suffer most solution in the body.

BIOLOGICAL FACTORS

But while it may be interesting to correlate the data of solubility studies with the known or supposed risks constituted by the inhaling of various mineral dusts, it must always be borne in mind that silica solubility is only one aspect of a very complex phenomenon. It would be idle to suppose that silicosis can be explained in any such simple terms as tissue reaction to a toxic substance furnished by the dissolving silica. The ætiology of the disease is so inadequately understood that no useful purpose can be served in trying to assess the importance of the various factors concerned in its production; save only to point out that there is a tendency at the present time to place so much stress on the physical aspects of the problem as to neglect the possibly more

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important biological factors. In Kettle's words (1936) "By infective silicosis is meant the modification in a dusty lung of the reaction of a chronic low-grade infection, frequently tuberculosis, in the direction of increased fibrosis." It is possible that all human silicosis may be infective silicosis.

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BRITISH ASSOCIATION OF RADIOLOGISTS

THE fourth annual general meeting was held in Belfast on May 13th and 14th, at the Whitla Medical Institute. At the opening session Prof. J. WOODBURN MORISON, the outgoing president, introduced and installed Dr. R. MAITLAND BEATH as his successor. Dr. Beath then delivered his presidential address, dealing with the history, development, and activities of the Association, and its future aims.

Scientific Communications

Prof. P. FLEMMING MØLLER (Copenhagen), who was warmly welcomed by the chairman, read a paper on Chronic Fluorine Poisoning as seen from a radiological standpoint. He had investigated with his co-workers large numbers of cases of this form of poisoning as it occurs in workers exposed to cryolite dust, or who may have ingested fluorine in other forms. He showed slides illustrating the condition of the bones; the outstanding feature is a marked increase of density, not unlike the marble bones of Albers-Schönberg disease. The conditions should be easy to differentiate as in fluorine poisoning there was also deposition of calcium in the ligaments and muscular attachments, particularly well seen in the spine, where in advanced cases the picture resembled that of spondylitis ankylopoietica. These deposits of calcium also served to distinguish the condition from Paget's disease, and from hypertrophic secondary deposits such as may arise from carcinoma of the prostate. The clinical findings were also of importance. Silicosis was present in half the subjects examined, and nausea, lack of appetite, and vomiting were complained of, with drowsiness and constipation. The element fluorine was widely distributed in nature, and poisoning might result from its presence in the water-supply, or because animals fed on contaminated pastures; in Iceland following a recent eruption many of the sheep were affected. Milk could convey the fluorine, and one of the slighter manifestations, mottled teeth, was seen in children and young animals whose mothers suffered from chronic poisoning. —Dr. J. F. BRAILSFORD remarked on the extreme thoroughness with which this investigation had been carried out both on the clinical and experimental side.

Dr. PETER KERLEY read a paper on Syphilitic Aortitis and Aneurysm of the Aorta, illustrated by many radiograms of great interest. He pointed out that the difficulty of diagnosis might be considerable, particularly where the symptoms were those of cough and dyspnœa, without obvious changes referable to the heart. It was often taught that a tumour in the mediastinum associated with an apparently normal ascending aorta could not be an aneurysm, but in his experience the sign was unreliable, as he could show in two of his cases. Expansile pulsation, if this could be demonstrated, was diagnostic, but it was rarely seen, and transmitted pulsation could be very misleading. The lobulated tumour border associated with enlarged glands could be simulated by daughter aneurysms; finally pressure on a main bronchus with atelectasis and effusion might look exactly like a primary bronchial carcinoma.

Dr. T. GARRATT HARDMAN described A Position for Radiography of the Fourth Ventricle. It was very tempting to use Thorotrast but there was a real danger of collapse and death on the table, particularly if ventriculography was carried out at the end of an intensive operative interference. It might be of great importance to the surgeon to know whether the block in a case with hydrocephalus was above or below the tentorium. He had found the most useful position to be a true lateral one with the patient face downward with nose and forehead in contact with the cassette, as for a sinus radiogram.

Dr. BRAILSFORD discussed Brodie's Abscess and its Differential Diagnosis. The lesion was always a result of chronic infection, and he emphasised the practical importance of careful localisation because of the difficulty of finding a small cavity in the centre of the bone.

Dr. M. C. TOD read a paper by Dr. RALSTON PATERSON and herself on the Radium Treatment of Angiomata in Children. She said that angioma was a true neoplasm, and was radiosensitive, and claimed that the cosmetic results obtained made radiation the treatment of choice. Cauterisation with CO_2 snow produced scarring, and was only successful with very small lesions. The capillary angioma, or port-wine stain, did not respond well to radiation, but was equally difficult to treat by other methods. If radium treatment was carefully planned it was perfectly safe. The best time to treat was during infancy, although radium could be used at any age. The dose must be controlled, and homogeneous irradiation obtained by radium arranged on Elastoplast moulds or implanted in the tissues according to the rule of the Paterson-Parker dosage system. At Manchester, radon in silver seeds was used for convenience. A safe rule was that all reactions should be avoided, and the plan recommended was to give repeated applications of 1500 r delivered in 5–6 days, with intervals of two months. As a rule four treatments produced complete disappearance of the neoplasm, but six or seven such applications could be given with safety. It was not suggested that this was the only method of irradiating angiomata, but experience had shown that it could be confidently recommended as a safe and permanent form of therapy. A number of photographs were shown illustrating the results which could be obtained.

Dr. S. COCHRANE SHANKS described Four Area Methods of X Ray Treatment of Tinea Tonsurans.

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THE COST OF A HOSPITAL

THE Departmental Committee of the Ministry of Health on the cost of hospitals have already issued an interim report[1] on "acute" general hospitals, and now publish a final report on hospitals of all other kinds (H.M. Stat. Office. Pp. 121. 2s.). They deal first with accommodation for maternity cases, sick children, and patients with chronic illness, and then with the other types of public buildings set out in their terms of reference: residential institutions for pulmonary tuberculosis, isolation hospitals, mental hospitals, mental deficiency colonies, public assistance institutions, and baths and wash-houses, including covered and open-air swimming-pools. They were directed to pay special attention to the establishment and periodic revision of standards, modern methods of construction, and the possibility of securing a reduction in present costs without impairing the efficiency of the buildings for the purposes for which they are designed. They have written throughout in terms of minimal or desirable accommodation for efficient service and the actual or relative cost entailed in adopting their recommendations is nowhere estimated in figures. It is left to the architect, the engineer, the quantity surveyor, and the rest to translate them into such specific terms as will enable those planning hospital extensions to judge of the cost these will entail.

THE MATERNITY DEPARTMENT

The committee framed their recommendations on a maternity department on the basis of one containing about sixty lying-in beds and forming part of a general hospital, but their plan can be easily modified for greater or smaller departments, thirty beds being the standard ward unit. They recommend separate accommodation for a few potentially septic cases, four observation beds, and ten antenatal beds. They regard eight beds as the maximum number for a ward and prefer wards of four beds, if they can be so planned as to provide good lighting and ventilation. They do not hold single-bed wards to be necessary throughout the department, but enough should be provided to facilitate classification and to allow a fair number of patients to be isolated. They recommend not less than six single-bed wards in each thirty-bed ward unit.

THE CHILDREN'S HOSPITAL

The special liability of children to infections and the need for practical measures to reduce the risk of their spread is emphasised. With thirty beds as a standard ward unit, small wards for six or even four patients and not less than six single-bed rooms in every unit are recommended. Infants under two should be nursed in single-bed rooms. Eighty square feet per bed is regarded as a satisfactory standard—considerably less than for an adult ward—but eight feet should be maintained between bed centres, to avoid cross-infections. Good lighting and ventilation and facilities for open-air treatment are particularly important in children's wards; open-air wards, verandahs and balconies, or large windows are essential. The ancillary room requirements are broadly the same in a children's as in an adults' ward unit, but more baths are required; a fixed bath in each single room preserves the advantages of isolation. Otherwise a changing-room is essential. A milk preparation room should be an annexe to the ward kitchen. Generous isolation accommodation should be provided.

[1] See *Lancet*, 1937, 1, 521.

CHRONIC PATIENTS

The advantages of providing accommodation for cases of chronic sickness as part of a general hospital are that patients who require active medical treatment or some special form of investigation may easily obtain it; the difficulties of staffing inherent in an institution which provides only limited interest and experience are avoided; and the nurses of a general hospital can obtain useful experience with chronic patients. A large number of patients are, however, better accommodated in a special chronic hospital. In such a hospital, administration and equipment are simpler and the general activity is less. There is therefore no objection to larger units than the normal, provided that the sister in charge has adequate trained assistants. A ward unit may therefore contain up to sixty beds unless there is difficulty in obtaining trained staff nurses. The younger and more mentally alert patients should be separated from the large senile group and provided with suitable occupation and recreation. Physically offensive patients should also be segregated. Smaller wards must be provided in sufficient number to allow of proper classification. Six single-bed wards in a unit should be enough. A long ward may be partitioned into sections, though separate wards are preferable. The bed space may be less than in a general hospital. The committee think that the longitudinal arrangement of beds for chronic patients is worth trying. The subdivision by screens which it entails permits of classification, but interferes with supervision and may necessitate an increase in staff. Verandahs and balconies are useful to give some of the patients fresh air, and for continuous open-air treatment of certain types of chronic disease. A portable X ray apparatus is sufficient, and for this and for electrical treatment one or two power points should be provided in each ward. A reception department is generally not necessary, and less residential accommodation for the staff is required in a general hospital of the same size, for a larger proportion is usually non-resident.

TUBERCULOSIS

Hospitals for tuberculosis are tending to resemble general hospitals, and their design is subject to much variation; they may be erected in single- or double-story pavilions. The site should preferably be rural, but reasonably accessible. The ward unit should be from forty to fifty beds, according to the proportion of ambulant patients; there should be not more than six or even four beds in each ward, and provision of single-bed wards for 15 to 20 per cent. of the patients. For bedridden patients it is desirable to have an open terrace or balcony; for ambulant patients wide windows are sufficient. A smaller allowance of bed space than normal may be given, on account of the open-air conditions of the wards. The hospital must contain a medical treatment unit, and provision for occupational therapy should be made. A central dining-hall is usually provided for ambulant patients.

ISOLATION HOSPITALS

Since the provision of a small isolation hospital with the full equipment and facilities proper to a large one is unduly costly, local authorities are advised to combine to provide a small number of large hospitals rather than a large number of small ones. A ward block should be used for only one disease at a time, and elasticity of accommodation is increased by having numerous small blocks. Each block should be not less than forty feet from the boundary or from any other block, and should contain only one ward unit; this can be of unequal portions, the larger being used for young children and older female patients. The size of the unit cannot be standardised by the number of patients that can be supervised by a sister, but must often be determined by the size of the hospital and the greater elasticity given by small units. About twelve beds in a ward

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should be the maximum, but the committee found much to be said in favour of quite small wards, especially for scarlet fever patients. Each unit should contain two single-bed wards. Twelve feet should be allowed between bed centres, and 144 square feet per bed. A cubicle block, consisting of a number of separate single-bed wards, is used for cases of double infection and doubtful diagnosis, and for those diseases of which only small numbers of cases are admitted.

THE MENTAL HOSPITAL

Mental hospitals must not only provide facilities for the treatment of mental illness and, in large measure, of physical illness as well, but they introduce many other problems relating to the care of patients. The proportion of ambulant patients is very high, fully 90 per cent. Day accommodation is needed, entirely separate from the dormitories and including provision for indoor exercise, occupation, and entertainment. Special provision must be made for noisy, dangerous, or violent patients, for those who require constant supervision or specialised accommodation and nursing on account of recent illness, and also for infirm and senile patients. In order to secure a measure of freedom for patients, it is desirable to place the buildings for each sex some distance apart, and to use certain buildings not occupied by the patients as a boundary line. As the staff consists of both sexes, there must be some duplication of buildings. The committee found that the maximum size for a mental hospital had already been fixed by the Cobb Committee in 1923 and the Macmillan Commission in 1926 as one thousand beds, and accept that figure. They approve the usual arrangement of a combined hospital for the two sexes, with association between them as part of the weekly or daily entertainment in the recreation hall or on the main sports ground. On an average, provision should be made in the ratio of 56 women to 44 men.

They recommend that a separate group of buildings be provided at each mental hospital where treatment may be given in the early stages of mental illness, when there is a prospect of convalescence and recovery, without the patients associating with more serious and chronic cases. Such an "early treatment centre" should comprise at least a conjoint admission hospital for both sexes and a convalescent home for each sex. Sites should be reserved for a villa for semi-convalescent patients and a villa for milder cases of mental disturbance, but these buildings need not be built until the admission hospital or convalescent homes are found too small.

Great importance is attached to the site which should not be urban but not be so remote as to be inaccessible for patients on parole, or as to prevent the staff going to a town for recreation. A large country site, with water and electricity available, near a main road and within easy access of a town is recommended. Specific requirements are a sick hospital, a special section for excited patients, ward units for the senile and infirm, and rooms for special apparatus, therapy, and pathological investigations. The question of a research laboratory is left open. As to accommodation for the staff, each resident nurse should be provided with a separate bedroom in a detached nurses' home, but one nurse should sleep so near each dormitory as to be immediately available in case of emergency. About 75 per cent. of the male staff are married, and in order to avoid the capital expense of a large male nurses' block, it may be advisable to house some of the single staff in cottages on the estate until the number of those requiring permanent accommodation is known. Recreation rooms required for the male nurses might include a billiards room and a sitting-room.

MENTAL DEFICIENCY COLONIES

These colonies should have not less than 800 beds if adequate classification of all grades is to be carried out. There should be a simple structure in which patients may undergo physical training, and one or more hostels to complete the training of those patients who are likely to go out and become self-supporting. There are advantages in single-story buildings not only for low-grade cases but also for active children and adults who require frequent nursing attention. The committee oppose the erection of buildings wide enough to take three rows of beds in the dormitories. They favour concentration of washing arrangements on the ground floor of the villas.

Detailed and useful recommendations are given for the design of public assistance institutions, public baths, and swimming-pools.

AUSTRALASIA

(FROM OUR OWN CORRESPONDENT)

MATERNAL NUTRITION AND NEONATAL DEATHS

Dr. Jefferies Turner, for many years director of infant welfare in Queensland, has lately drawn attention to the decrease in neonatal mortality associated with adequate maternal nutrition. The infant mortality-rates in Queensland and South Australia used to be equal. Since 1931, however, the rate in South Australia has been lower, and it was much lower in 1936, when it reached to within one decimal point of the New Zealand rate, the lowest in the world. In an attempt to explain this difference, a comparison was made of the mortality-rates for the first month and for the next eleven months for the two States. In the three years 1934–36 the mortality-rate in Queensland during the eleven months following the first month has been consistently slightly lower than in South Australia, but this advantage has been more than counterbalanced by the lower rate during the first month in South Australia, as shown in the following Table :—

MORTALITY-RATE PER 1000 BIRTHS IN QUEENSLAND AND SOUTH AUSTRALIA

Year.	In first month.		In next eleven months.		In first year.	
	Q.	S.A.	Q.	S.A.	Q.	S.A.
1934 ..	29·0	22·3	11·6	13·2	40·6	35·6
1935 ..	27·3	23·8	10·0	11·1	37·3	35·0
1936 ..	26·3	20·8	9·9	10·3	36·2	31·1

The credit for the lower neonatal rates in South Australia, and more especially in Adelaide, in comparison with Queensland and Brisbane during the last five years, cannot be due to the work of the child welfare centres, for infants are only very rarely brought to these centres during their first week in which about 86 per cent. of this mortality occurs. Neonatal or first-month mortality can be reduced only (1) by improved health of the mothers, and (2) to a less extent by better management at birth. There is no reason to think that the latter is greatly superior in South Australia. Examination of the facts points to better nutrition as the real cause. The last seven years have been years of economic depression and unemployment, only partially relieved towards their end. The unemployed are concentrated mostly in the capitals, and it is they that are most exposed to malnutrition. In Queensland, the most important cause of malnutrition among women is the great deficiency of milk in their diet, which is especially harmful during pregnancy. Although much of this is due to want of knowledge,

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and not to economic causes, it is greatly aggravated among those living on the edge of economic and nutritional adequacy. In South Australia during the "depression" the Government adopted the policy of supplying milk rations to the families of the unemployed. The distribution of milk to children and mothers began in 1930. In 1935 the South Australian Government asked the advice of the British Medical Association, and a committee of the Association strongly recommended that every child up to six years of age receiving rations should be given one pint of milk daily, children aged six to thirteen years half a pint, and expectant and nursing mothers one and a half pints in addition to other rations. This advice was taken by the Government and the milk ration is issued to every mother who produces a medical certificate of pregnancy and evidence that she needs the milk ration.

In the opinion of Dr. Turner, this is a true and adequate explanation. If this be so, two conclusions are imminent: first that the present high neonatal or first-month mortality of the Australian States can be considerably reduced, and secondly that this is a matter demanding the careful and earnest attention of all interested in saving infant life.

UNIVERSITY IDEALS

Several aspects of the life and organisation of the University of Melbourne were strongly criticised by Prof. F. Wood Jones, F.R.S., in a valedictory oration delivered in the Melbourne town hall before he left Australia to take up the chair of anatomy at Manchester and have since been the subject of fruitful discussion. In outlining the development of universities he pointed out that in the old world they began as quiet associations of teachers and students, giving an ideal expression of the mellow culture of the classical period. Sectarian religion at first played little part in the selection of scholars for such places, which were homes of cosmopolitan learning, and which transcended national boundaries and prejudices. By the end of the eighteenth century, however, they ceased to be democratic and had become hedged with the strangling growth of sectarian religious prejudices. The early nineteenth century had seen the establishment of the "new universities" like Berlin and London, which were unattached to any particular creed or school of thought. These were democratic institutions with the ideal of the greatest happiness for the greatest number. They instituted technical training, but it was no mere apprenticeship to some skilled vocation. The American universities established at the same time had inherited the defects of their origin as "continuation schools." When measured by the only true test, which was the preparation for intellectual life of all those who had enough intelligence to comprehend its meaning, universities, while attaining some degree of exclusiveness, could still fall far below the university ideal.

Melbourne had steered a middle course between the European university ideal and the more utilitarian ambitions of the American training college. But though the University of Melbourne may have been established on the broad non-sectarian lines laid down by the founders of the new universities, sectarian influences were at work at the very outset of the movement to establish their residential colleges. Frankly admitting that he expected little sympathy with his views, Prof. Wood Jones said that any sort of recognition of the claims of sect, creed, or religious denomination of any kind within the university was a retrograde step in Melbourne's attempt to cater for the intellectual life of the community; and that the division caused by sectarian issues was one of the outstanding defects of the intellectual life of Australia. He also said that the possibilities of free and stimulating discussion between teacher and student were almost non-existent in most of the faculties of Melbourne. Australia should aim at securing men of outstanding character and ability to fill university posts, and when they were secured, there should be a very much greater freedom of intercourse between staff and students than could prevail under the present conditions of understaffing.

A university should be regarded as providing a mental clinic for young people, rather than a machine which enabled them, in a mechanical way, to earn a living.

AN AUSTRALIAN BRANCH OF THE DIABETIC ASSOCIATION

Though Australia has a sprinkling of members of the parent Diabetic Association, it is obvious that the great distance from the headquarters and the different conditions must rob Australian diabetics of the full benefit of membership. For some time a few medical practitioners in the several capital cities have wished that some branch of the Association nearer home could supply Australian diabetics with information and social care. To this end a meeting of medical practitioners, almoners, dietitians, and diabetics was recently called in Sydney, and a provisional committee was elected to take steps to form an Australian branch of the Diabetic Association. The committee is representative and includes some prominent citizens, both diabetic and non-diabetic, besides dietitians and other diabetic workers. No medical men are included in the committee, although a small medical advisory committee is considered desirable. At the meeting the Minister for Health for New South Wales expressed a lively interest in the movement, and suggested that, if he were approached by the Association, funds for diabetic research might be made available at approved clinics.

The effect of belonging to a well-organised diabetic family, facing a common difficulty with courage, confidence, and knowledge, confers an important benefit on any diabetic's morale, and it is to be hoped that such a promising social service will receive the encouraging support from the profession which has been shown in Great Britain to be indispensable for its success.

POST-GRADUATE EDUCATION IN NEW SOUTH WALES

The opening of a post-graduate school at the Prince Henry Hospital, Sydney, on April 8th marks a new chapter in the history of post-graduate education in New South Wales. The New South Wales Post-Graduate Committee in Medicine, established by the University of Sydney, holds a general revision course each year, in which instruction is given at all the larger metropolitan hospitals. This is designed particularly for general practitioners, and its aim is to give the maximum of clinical instruction in a limited period. Courses dealing with special subjects are also arranged, week-end courses are held at various country centres, and instruction for higher degrees and diplomas is provided. In addition there are courses by visiting lecturers, and the committee arranges for residence at obstetrical, children's, and general hospitals, instruction in the diseases of children and infant feeding, attendance at clinics for the diagnosis and treatment of cancer and tuberculosis, and tuition in anæsthetics.

Attention has often been drawn to the advantages of having a post-graduate hospital where approved

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students could bring up to date their knowledge of the rudiments of medicine and surgery, but undertake study in special branches. This need will shortly be satisfied at the Prince Henry Hospital. The Government of New South Wales, considering that this hospital would be more effectively administered by a board than by departmental officials, and at the same time desiring to provide a hospital where post-graduate training might be carried out, passed the Prince Henry Hospital Act, according to which the hospital is controlled by fifteen directors, representative of the medical profession, the University, the hospitals, and the Government itself.

UNITED STATES OF AMERICA

(FROM OUR OWN CORRESPONDENTS)

NEW YORK STATE ON MEDICAL CARE

AT its annual meeting, which opened on May 9th, the medical society of the State of New York received a report from a committee charged to formulate the principles and problems of a State health policy. Physicians, the general public, and the government are each assigned a responsibility in the provision of such a policy. The public must provide proper educational facilities, hospitals, and laboratories. If private citizens are unable to pay the price it may become necessary to provide them by government subsidy, but in this case it is held to be important that physical equipment only is subsidised and not personnel. The report then broached the controversial question of voluntary insurance for the middle-income class, but the decision of the meeting must be taken as a flat rejection of health insurance. In view of energetic propaganda among the members of the society as well as the public this is less surprising than is the energetic defence of the insurance principle by liberal members of the house of delegates.

Among guest speakers on the programme is Mr. Victor Negus of King's College Hospital, London.

THE CENSUS AND THE POPULATION

The fifth annual meeting of the Population Association of America was held at Princeton University from May 6th to 8th, when the subject chiefly discussed was the 1940 Census. Dr. Halbert L. Dunn, chief vital statistician of the Bureau of Census, described some of the problems which his department must face in attempting to provide accurate information. The most serious defect is the incompleteness of registration in the rural areas of the South; the second problem is the difficulty of estimating the population between the census years. He mentioned that the International List of Causes of Death needs revision. Even without such revision some attempts will be made to make separate classification, as for example of deaths from rheumatic heart disease.

A discussion took place between Mr. Frederick Osborn and Mr. H. P. Fairchild as to eugenic policy in this country. The latter contended that we have yet no mandate from the American people which will indicate what type of population is desired. Until quite recently, at least, certain of the captains of industry were seeking to import immigrants willing to do menial tasks, without regard to their intelligence. Mr. Osborn pointed out that we have about one million people whose defects are such as to render them unfit for social life or for the enjoyment of their own lives. A much larger section of the population is suitable for eugenic selection in order to diminish unfit stocks. In this respect conservative judgment must be exercised. While the conference was coping with the difficulty of taking immediate steps to improve the population, Dr. Kosmak pointed out that there is a great amount of proved pregnancy wastage, which is subject to immediate salvage. This includes at least 600,000 abortions yearly and 75,000 stillbirths.

SCANDALOUS BIRTH OF A BABY

An educational film was recently produced under the auspices of the American Committee on Maternal Welfare showing to lay audiences the elementary physiology and hygiene of pregnancy and parturition. In spite of its sponsorship—the committee includes representatives from such bodies as the American College of Surgeons and the section in obstetrics and gynæcology of the American Medical Association—the film was banned as obscene in some localities. These gave the pictures a news as well as an educational value and the enterprising picture magazine *Life* on April 11th printed four pages of pictures from the movie. Beforehand they sent a letter to each of their subscribers warning them of what was to come and giving them an opportunity to remove the centre pages in case they did not desire the children to see them. The authorities in the Bronx borough of New York City, in Pennsylvania, and in some parts of New England found the issue obscene and of 2 million copies some 10,000 were seized by the police thus ensuring the rapid sale of the remaining 1,990,000. A test case is going to the courts in New York State. The same courts will decide on the showing of the original moving picture. The State regents have at present decided that "the film has a high educational value" but "as motion pictures are attended by children of all ages in large numbers and by people of all creeds, colours, and races, this picture is not licensed to be shown in places of amusement." The Committee on Maternal Welfare is appealing against this decision. It is taken under Section 1082 of the Education Law with which the regents found the film "far in conflict." This law provides for licensing films unless they are "obscene, indecent, immoral, inhuman, sacriligious, or of such a character as to corrupt morals or incite to crime."

At their recent meeting in Washington the State and provincial health authorities adopted a resolution deploring the attitude of officials who have tried to prevent the sale of *Life* because of its treatment of this theme. "This action in itself indicates the necessity for such public health education."

POSTSCRIPT

By unanimous decision three justices of a Bronx court on April 26th found that the pictures published in *Life* on April 11th depicting the birth of a baby were not indecent and acquitted Roy E. Larsen, publisher of the magazine. Justice Perlman held that conceptions of decency are dynamic and not static and depend upon changes in "popular attitudes" "The picture story," he said, "was directly based on a film produced under the auspices of a responsible medical group. There is no nudity or unnecessary disclosure. The subject has been treated with delicacy."

WIENER KLINISCHE WOCHENSCRIFT.—The association that has always existed between this journal and the medical faculty of the University of Vienna is to be strengthened. Hitherto it has been the official organ of the Gesellschaft der Aerzte; it will now also speak for the University.

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GENERAL MEDICAL COUNCIL

PRESIDENT'S ADDRESS

OPENING the 147th session of the Council on Tuesday last, Sir NORMAN WALKER referred to the death since the November session of Dr. E. Magennis, representing the Apothecaries' Hall, Dublin, "actually our oldest colleague, and a universally popular one"; of Mr. W. H. Dolamore, who had represented the English graduates in dental surgery from 1921 to 1934; and of Mr. J. W. A. McGowan, representing Scottish dental graduates. Dr. Edwin Matthew, he said, was not seeking re-election by the Royal College of Physicians of Edinburgh. He welcomed Dr. J. C. Flood and Dr. Douglas Kerr in the place of Dr. Magennis and Dr. Matthew.

INDIA

"We have received during the year," the President continued, "a number of friendly communications from the Medical Council of India, and I have had personal interviews with several past and present members. In constructing their first All-India Medical Act, the Indian Legislature had the benefit of our seventy-five years' experience. Sir John Simon, one of our wisest councillors, commented in 1873 'The first council was a first timid experiment of the legislature, and the powers of control given to the council were far too small.' The Indian Medical Council Act entrusts the Medical Council of India with powers of visitation and inspection which are wider in form than any possessed by the General Medical Council, either under the Act of 1858 or under the Act of 1886. It is due to the common sense of past councillors and the temperate guidance of wise presidents, notably my immediate predecessor, that our Acts work as well as they do. The Medical Council of India have made a good start on the enormous problems which confront them. They have not recently seen fit to recommend the inclusion of any further medical qualifications granted by universities in British India in the first schedule to the Indian Medical Council Act, 1933, as recognised medical qualifications for the purposes of the Act. It follows that no further proposals have been made in favour of the recognition of any such qualifications by the General Medical Council under Section 13 of the Medical Act, 1886.

BURMA

"But an important constitutional change in the position with respect to British India took place during 1937. On April 1st Burma ceased to be part of India in accordance with the provisions of the Government of India Act, 1935, and became a separate British Possession within the meaning of Part II of the Medical Act, 1886. By order in council of March 18th, 1937, Part II of the Act has been deemed to apply to Burma on and after April 1st, 1937, and on the separation of Burma from India the jurisdiction of the Medical Council of India ceased to extend to medical institutions in Burma by which medical qualifications are granted. The Medical Council of India had, however, already carried out the duty assigned to them by Subsection (4) of Section 11 of the Act of 1933 by making arrangements for the inspection of the medical courses and examinations of the University of Rangoon. The report of the first inspection of these courses and examinations in 1935 did not satisfy the Medical Council of India that qualifications granted by the University could properly be included in the first schedule to their Act, for reasons with which the executive committee of the General Medical Council found themselves in complete agreement. On the report of a second inspection a year later, the Medical Council of India found themselves able to modify their previous view, and in the light of some substantial improvements in the conditions made a recommendation, which was accepted, in favour of the inclusion in the schedule of the qualifications of M.B., B.S. granted by the University. The qualifications were not recognised for the purposes of the Indian Medical Council Act until Dec. 10th, 1936, and Burma had, as I have indicated, by this time become a separate British Possession, with the consequence that the sole responsibility of dealing with the question of the recognition of these qualifications under Section 13 of the Medical Act, 1886, rested with the executive committee of the General Medical Council in the discharge of the duty delegated to them by the Council. Having regard to the improvements in the courses of study and examinations of the University which the inspectors of the Medical Council of India had found on their second inspection, the executive committee resolved that the qualifications should be recognised, in the terms of the Act, for the time being. They thought it proper that the continuance of recognition should be made subject to the conclusion of arrangements with the University for a visitation by a visitor appointed on behalf of the General Medical Council, and this suggestion has been conveyed to, and accepted by, the University. The executive committee have again had the good fortune to secure the services of Sir Richard Needham as visitor of the University, and he proposes to combine this duty with further visitations of the University of Hong-Kong and of the King Edward VII College of Medicine, Singapore, in the course of the winter. I have reason to know that the Colonial Office and the local governments share the high estimation which we feel of the value of the reports made by Sir Richard on his visitations, and of the coöperation which he is able to secure from the authorities of the institutions visited.

PROFESSIONAL CONDUCT

"We have been asked by the Home Office to give such publicity as we can to the importance of the exercise of every precaution by registered medical practitioners to ensure the safe custody at all times of dangerous drugs and other poisons entrusted to them as a matter of professional privilege. The Home Office letter has already been published in the minutes of the meeting of the executive committee on Feb. 28th, but the committee felt that a reference to the matter here would help to draw general attention to a matter of public importance.

"In my address in May, 1933, I referred to the question of fee-splitting, a practice which is, I am sure, not so prevalent in this country as it appears to be in some others. The executive committee had before them in February, transmitted by the Dominions Office, a recent Act of the Legislative Council and the Legislative Assembly of Victoria, amending Section 15 of the Medical Act, 1928, of the State, which is to be found in the volume of our Minutes for 1931. Briefly, the amending Act provides that any registered medical practitioner who is guilty of the offence of fee-splitting as defined in detail in the Act shall be liable to heavy penalties.

ENTRIES TO THE PROFESSION

"Members will have observed with interest from the table prefixed to the Medical Register for 1938 which records the variations in the numbers of

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registered medical practitioners that in 1937 the names of 2214 persons were added to the Register, including 273 in the colonial list and 13 in the foreign list. The total number removed for various reasons (mainly on evidence of death, which accounted for 125 fewer removals than in 1936) was 1090, so that the Register for 1938 contains 60,163 names, 1153 more than last year, and the largest number ever reached.

"The number of medical students registered in 1937 was 2297, a decrease of 247 as compared with the year before. This is the fifth highest number ever reached.

"A year ago the Council recommended the adoption of a new method of compiling the Students' Register. It will not come into operation until the beginning of the academic year 1938–39, but I think we may anticipate that the students' register for 1938 will be the forerunner of a series of more and more complete registers. There are times, and this is one of them, when it is important to know the number of students engaged in the study of medicine.

COMMITTEES

"The Curriculum and Education Committees, and not least their chairmen, cannot but be gratified by the reception accorded to their reports, and to the resolutions in regard to professional education, founded on their labours, which come into operation on Nov. 1st. Probably not everything that they have recommended can at once be accepted by all the bodies, but there is evidence of approval of the proposals that the medical curriculum proper—I know there are some who do not like the term—should be not less than five years, and of a general acceptance of the conviction that the vacations should be shortened, and that the time thus provided should be devoted to clinical work.

"As I have ventured to remind you on a previous occasion, the Council so long ago as 1864 recorded the opinion that while four winter, or three winter and two summer, sessions then formed the course of study, evidence should be produced that the remaining portion of the four years of the curriculum had been passed in the acquisition of professional knowledge.

"I note that the senior treasurer in presenting the report of the Finance Committee will have the satisfaction of announcing that the accounts of the general and branch councils for the year 1937 show a surplus of income over expenditure of £3390 4*s*. 9*d*."

A vote of thanks to the President for his address was moved by Mr. Harold Collinson and seconded by Sir Arthur MacNalty.

The two new members of the Council were introduced, Dr. Flood by Dr. D. J. Coffey, and Dr. Kerr by Dr. Sydney Smith.

The Council then proceeded to the consideration of penal cases.

PANEL AND CONTRACT PRACTICE

Health Insurance Policy in Eire

WHEN it was decided a few years ago to amalgamate the several approved societies into one national health insurance society, it was hoped that considerable economies in administration would follow, with ultimate advantages to the insured members. As the members have not reaped these advantages there is a certain degree of discontent which finds expression in letters to the press and in resolutions of trade-unions and other such bodies. The society had, however, to shoulder two burdens which have delayed the fruits of reform, although most of its critics fail to recognise this fact. In the first place, there was great disparity between the general approved societies both as to their financial strength and as to the benefits they provided for their members. Some of the stronger societies gave substantial additional benefits, such as dental, ophthalmic, and hospital benefits. The weaker societies were unable to do more than provide the statutory benefits, and the capacity of some to do this had nearly reached exhaustion. The strength of the stronger societies which came into amalgamation was neutralised by the weakness of the weaker, and up to the present the unified society has been unable to provide any additional benefit. The second clog on the development which it was hoped to attain by amalgamation is the fact that when amalgamation occurred it was necessary to dispense with the services of a large number of employees of the former societies and the entire burden of bursaries and compensation had to be borne by the unified society.

It is natural that those who formerly enjoyed additional benefits should be discontented when they find that such benefits are no longer to be had, but they do not realise that previously they were in a favoured position, as the strong financial position of the wealthier societies had been in a great measure due to the fact that they selected their members carefully as to health, thereby defeating the object of national health insurance. Medical benefit has never been among the benefits provided in the area of the Irish Free State, and although the societies were at liberty to provide it as an additional benefit, none ever did so. The demands now put forward include not only the restoration of additional benefits but the establishment of a full system of medical benefit. Unfortunately those who put forward this demand have not allowed their imagination to travel beyond the panel system which exists in Great Britain and in Northern Ireland, which, in the opinion of many, is unsuitable for application to the rest of Ireland and particularly to rural Ireland.

There has been for long an almost if not quite unanimous opinion in favour of establishing a system of treatment as part of the national health insurance system. But none of the committees or commissions which have studied the question have favoured the panel system. Both the Irish Public Health Council, which reported in 1920, and the committee of inquiry into the public medical services of the Irish Free State, which reported in 1926, recommended the establishment of a national or State medical service which would provide treatment for not only insured members and their families but also for those of similar financial status who would insure for the purpose voluntarily and for the poor who at the present receive treatment from the dispensary medical service. Such a national medical service would in fact embrace the present poor-law medical service. These recommendations received the unanimous approval of the medical profession and got general support among the public, but their carrying out was postponed for financial reasons.

It would be unfortunate if the path to the establishment of a thorough scheme of medical reform were to be blocked by the adoption of an unconsidered half-measure such as the panel system. It is true that the schemes of 1920 and 1926 would require reconsideration before adoption, and the best imme-

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diate step would probably be the appointment of a commission to study the whole problem in relation not only to health insurance but to other branches of social insurance as well as to existing systems of medical treatment. Such a body should include persons with a knowledge of health insurance schemes on the continent of Europe and elsewhere.

A Monday Morning Problem

A foreign maid was engaged to begin her duties on a Monday in January. She crossed from the Continent on the Sunday, the crossing was not smooth, and on arrival at her place of employment late that night it was necessary to call in a doctor, who attended her then and again on the two following days. The employer asked the doctor on the Sunday night whether the girl was entitled to be treated as an insured person; the doctor, not unnaturally, was not sure and advised the employer to inquire at the Post Office. In due course he submitted an account for the night visit and for the two further visits, and the employer applied to the insurance committee for the withdrawal of the account. While perhaps it would have been better if the doctor had issued form G.P. 4 as notice of his intention to render an account (as provided under Clause 7 (2) of the terms of service), he can hardly be criticised for acting as he did, for not only had the woman never been in England before but, owing to the effects of sea-sickness, she had not begun her duties until after the treatment had finished. Actually she was under contract of service as from the Monday, and therefore on that day an insured person entitled to medical benefit. Although summoned on Sunday and in attendance before midnight, the doctor did not leave until the small hours of Monday morning, so that the patient became insured while the doctor was with her. The committee decided she must pay for the first visit, the account for the subsequent attendances to be withdrawn, the doctor receiving credit as for a temporary resident.

There is no waiting period for medical benefit. Some years ago a lad, who was due to enter upon insurable employment on a Monday, met with a bicycle accident on the previous Saturday. He was brought home by train on Sunday, and on the Monday when he should have begun his work it was necessary to call in a second doctor to give an anæsthetic for the reduction of a dislocated shoulder. The claim for an anæsthetist's fee submitted by the insurance practitioner was passed for payment after a ruling by the Ministry of Health that the patient had become an insured person, and therefore entitled to medical benefit, on the Monday.

GRAINS AND SCRUPLES

Under this heading appear week by week the unfettered thoughts of doctors in various occupations. Each contributor is responsible for the section for a month; his name can be seen later in the half-yearly index

FROM "SILVER DOCTOR"

IV

DURING the past few months a wide variety of opinions on the present state of British medicine has appeared in these columns expressing satisfaction, hope, indignation, and even despair. Prophets and philosophers have foretold mighty changes in the near future, pessimists have hinted at approaching revolution, and there have been such attacks on the established order of things as to threaten an onset of a universal anxiety-neurosis. Such are the classical indications of progress and from all sides comes the call for revision. Surgeons thunder for yet more surgery and specialists for increased specialism. Scientists demand additional research, clinicians plead for more art, and bureaucrats clamour for fresh legislation. Medical education is ruthlessly denounced and the habits and diets of all time are held to ridicule. Yet it needs but a little consideration to appreciate the healthfulness of this universal attitude of criticism. We are living in an era of vast developments, the world stirs from a long sleep, civilisation is threatened, and medicine, newly awakened to her responsibilities, hastens to put her house in order. Household reorganisation involves many considerations and everything from cellar to roof comes under review. Even the pots and pans call for attention. The medical curriculum has been the subject of much recent deliberation. Sweeping changes have been suggested and are now in process of organisation. There are three subjects which long service as a teaching and practising physician convince me as calling for recognition: (1) the teaching of elementary psychology; (2) the present-day neglect of senility as a clinical study; (3) the importance of medical ethics.

* * *

The diagnosis and treatment of abnormal nervous states (formerly confused under such terms as functional neuroses and neurasthenia) and the adequate study of early mental disease are two of the most notable advances of recent medicine. The late war loosed a flood of such cases and the conditions of modern life continue to add to their number. A knowledge of the normal is an obvious essential to any comprehension of the abnormal, yet in the present curriculum little provision is made for the student to acquire the elements of psychology. Shoals of so-called "functional" cases come in the first instance under the ken of the family doctor who has been taught little or nothing about them. Every medical student is stuffed with physiology as a necessary prelude to the understanding of pathology, and without any pretensions to making him a physiologist. Surely he requires to learn the elements of psychology on similar lines for identical reasons.

In my student days candidates for the M.D. and M.S. degrees of the University of London were required to pass a written examination in psychology, but at my own hospital no provision existed for instruction in this subject. Every student had to attend a limited number of demonstrations on mental cases at a local asylum, where we learned the rules of certification and precious little else. At that time Freud was hardly known and psychology was popularly confused with metaphysics. Shall I ever forget my own struggles? Hopeless flounderings in the writings of such authors as Kant and Locke made confusion worse confounded, till Providence guided one into the wise hands of the Bethlem School, where Maurice Craig and Savage saved the situation. Titchener in America had just produced his masterly primers of psychology, and Craig helped us to an understanding and appreciation of the subject. I shall never forget Savage's ward-rounds at Bethlem Hospital and the way in which he attempted to relate the rudiments of

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psychology to the symptoms of early mental disease. The knowledge thus acquired, even if a good deal of it would not now be accepted, gave one a new outlook on medicine and nothing helped so much to the adequate understanding of the sick patient. One learned something of the intricate associations of mind and body and the varying degrees of nervous disorder brought about by physical disease, and vice versa. The later deletion of psychology from the M.D. examination has seemed to me nothing short of a calamity from the student's point of view.

Since then the knowledge of this subject has advanced by leaps and bounds, but nowadays psychology is regarded too much as the prerogative of specialists. Every medical practitioner needs a knowledge of its rudiments. It is a necessity to a due comprehension of so much of his work—the management and education of children, the "kinks" of the unstable, the treatment of nervous breakdowns, the choice of careers for adolescents—to mention only a few. Without it he fails to understand the nervous manifestations of physical disease and he cannot diagnose or remedy the maladjustments which cause so much of to-day's invalidism. Always there will be the need for psychological experts in whose hands psycho-analysis—that two-edged weapon—or any other form of detailed analysis must remain. The immediate need is not for more experts, but that every medical man's training shall include a sufficient knowledge of psycho-pathology to recognise and correct the slighter cases. How many anxiety neuroses could be nipped in the bud if correctly recognised and treated at their onset?

Let me quote a recent personal experience. Interested in a working-man's anomalous illness I called on his panel doctor. My lord of the Panel was florid, fat-and-fortyish, and his big Vauxhall car testified at least to his material success in practice. "Yes, my dear Sir, Jones was a puzzle and I sent him to hospital where he has been examined from stem to stern. Nothing wrong, Sir, nothing; just a case of nerves." Later inquiries revealed that no treatment of any kind was suggested for the wretched Jones and his nerves. "Nothing wrong Sir, only nerves!" Yet we call 'em Doctors!

* * *

In everyday medical practice children and old people form a notable proportion of a doctor's patients. Very properly the curriculum insists that every medical student shall have special instruction in the diseases of children, an enormous literature is devoted to the subject, great hospitals are consecrated to youngsters, and children's doctors are common objects in Harley-street. Viewed from a similar angle old age is curiously neglected. Few books or hospitals and no specialists at all, so far as I know, devote themselves to senility, and the average student learns little or nothing of its peculiarities. From every point of view this is a mistake which calls for correction. Senility is a comparative term with wide variations in its onset and the geography of its manifestations, yet it has a definite physiology and pathology as well as important principles peculiar to its management. The aged may not be so valuable to the State as their juniors—the one has a potential, the other a past value—yet the fact that they have survived the racket of life for so long surely merits reward. Yet to-day Medicine ignores what the State deems worthy of pensions! Moreover they often make or mar the practitioner's success. The old are proverbially garrulous!

It has been said that at 40 a man is either a fool or a physician. At 60 he is usually neither the one nor the other. To-day's sexagenarian is an individual who has garnered a definite series of bodily habits which he or she regards as essential to health, and to which he clings with a fortitude in itself wholly admirable. No drowning man ever clutched his straw more devotedly than these folk hold to their tenets. These may include any or every detail of their lives, whether matters of diet, exercise, clothing, sleep, or drugs. The wise doctor at his first interview with an elderly patient seeks to dig his beliefs into the daylight and does not interfere without mighty good reason. The customs of decades may not lightly be broken. On the other hand in them *may* be found the cause of present ill health. After all, habits whether in motors, horses, or humans *are* important factors!

Too few young practitioners realise the complex mentality of many old people; the curious timidity which grows with the years, often unrecognised by themselves but prone to peep out at any suspicion of failing health; the common defence-reactions which glory in any indication of deferred decay and pine for its recognition ("my doctor tells me that my arteries are those of a young man"); the persistent contraction of a mental horizon which eventually limits the aged man's interest to little save his own sensations; the protective slowness which comes to pervade his every function; all these and many others demand a sympathetic tolerance which some doctors forget in their dealings with senility.

On the physical side symptoms and signs in the aged may possess a different significance to similar conditions in younger subjects. Blood-pressure aberrations and pulse irregularities may have to be regarded from a fresh angle. Glycosuria or albuminuria are sometimes of less sinister import. Any change in the customary bowel habit of an old subject is an alarm-signal. A rectal examination of elderly men is obviously wise. The skin of the aged is a fine index of their senility, and an examination of the colour and blood-return in toe-nails affords helpful evidence of their circulatory stability. The easy day-sleep and broken night-rest of some old people are traps for the unwary, since senility is prone to beget regular irregularities of function and conduct. The ancient tag that a "man is as old as his arteries" has worn threadbare, and the radial *alone* cannot be accepted as safe evidence of any patient's entire arterial tree. Pain itself, most eloquent of all symptoms, may have a special explanation in the aged whose inelastic structures work stiffly and whose timidity is ever-ready to confuse a trifling discomfort with serious pain. In such cases confident reassurance and simple local treatment is often wiser than drugs.

* * *

The treatment of the aged is no easy matter. Many old people are suspicious, all are avid of attention, and the majority have fixed ideas as to what does or does not suit that mysterious entity which they are pleased to speak of as their "constitution." It behoves the practitioner to receive such information with respect, if not always with obedience. Idiosyncrasy does exist; yet all that glitters is not gold. I am not alone in recalling old dames who say that aspirin is poison to them and yet a prescription for acetyl-salicylic acid works wonders; and others who "must never take opium in any form" are relieved in no time by a few doses of pil. saponis co. Some elderly people stand drugs badly and it is well to begin with small doses. Local treatment

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is beloved by old folk, but it is unwise to adopt drastic measures lest one disturb their roots.

What's that? "Elementary, Watson"—yes, of course: I'll ring off.

* * *

Every hospital physician has old patients in his wards and should make a point of demonstrating the many clinical peculiarities of senility to his students, who otherwise learn them only too sadly in later years by trial and error. Occasional lectures on old age would be invaluable. I am not sure that in the years ahead a Professor of Senility may not become a recognised institution in every medical school.

* * *

There is another unoccupied area for some inscrutable reason—a sort of no-man's-land—in medical education. It is strange, but unpleasantly true, that from the day he enters a medical school to the time he emerges as a qualified practitioner the medical student has little or no regular instruction on medical ethics. This is a grave reproach. School or university teaching includes little of business methods or financial procedures and few youngsters to-day keep personal accounts. The five or more hospital years are crowded with the acquisition of necessary 'ologies. Too often, and I recall vividly my personal experiences, the newly fledged doctor finds himself faced with a medley of practical difficulties of which he has had little warning. He knows nothing of the traps which beset the purchase of a practice or the taking of a partnership, the responsibilities of a locum tenens, or the multifarious odd jobs expected of every practitioner outside his obvious duties as a healer of the sick. He has learned how to open an abscess or treat a pneumonia, but has little idea of his duties towards fellow-practitioners or his rôle in a criminal case. The routine of certification or the giving of evidence in a law court is unexplored country. He speaks of "my patient" with pardonable pride but without any clear conception of what such proprietary assumption includes. He has the vaguest notions of his correct course if another doctor's patient asks his opinion, what his duties are with regard to consultations, or the proper procedure about fees. These examples could be multiplied. Yet mistakes in any such positions, easily made in all innocence, may land him into serious trouble. Is it any wonder that some practitioners never learn to appreciate the proper attitude towards patients or colleagues? Is it a matter for surprise that the unbusiness-like habits of medical men have become a byword and a reproach? Medical ethics is a comparatively small subject and its rules are mainly those of common sense, but what chance has the young doctor of acquiring its details without some guidance? It is true that most of it can be found in books, but goodness knows that our students have enough to read, and in any case this subject lends itself to the spoken more than to the written word. Half a dozen talks of an hour apiece would cover all the necessary ground and should be attended by every man before he is allowed to present himself for his final examination. Surely here is a job of work for our consulting physicians!

* * *

The reorganisation of the medical curriculum bristles with difficulty. It is hard to see the wood for the trees. The aforegoing suggestions indicate gaps which can be filled without great changes. After all it is the little foxes which spoil the vines.

*** *This concludes the four articles by "Silver Doctor." Next month A London Practitioner will be responsible for these columns.*—ED. L.

PUBLIC HEALTH

Public Assistance Beds

Dr. C. M. Smith, medical officer of health for Northants, and Mr. W. H. Abbott, county public assistance officer, have been inquiring into the causes of the steady increase in admissions to the council's public assistance institutions. In 1930 476 beds were available in these institutions, and although by using other rooms and crowding the beds this number has been increased to 553, the accommodation is still being overtaxed. Most of this accommodation is occupied by elderly chronic patients, more than two-thirds of the inmates being over 65 and having been in residence more than a year. In Northants as elsewhere the age-distribution of the population is slowly changing, and in the last thirty years the number over 60 has risen by 56 per cent. while the general population has increased by only 5 per cent. A comparison of the Northampton life table constructed by Richard Price for the years 1735–80 with the latest table for England and Wales shows, however, that in 200 years there has been very little change in the expectation of life of old people; at 60, for instance, the expectation of life in the old Northampton life table was 13·21 years and in the latest table 14·4 years for males and 16·5 for females. Old people are not living much longer, but more people now survive to old age.

Although there are no available statistics on the subject, the incidence of disability among the elderly is presumably not increasing; on the other hand not much decrease is to be expected in the future, since most of the illnesses of old people are due to degenerative processes incidental to their age. In recent years the attitude of the public towards the county institutions has altered; the stigma of the poor-law is rapidly disappearing, if it has not already gone; institutional life has become more pleasant and old people are no longer averse to seeking admission. They are also more ready to leave home, for the diminishing size of families means that there are now more old people without sons or daughters to care for them, and girls who used to stay at home now usually marry or go out to work. Often, too, the mother of the family also goes out to work or feels that she cannot do justice both to her children and to an elderly parent.

A survey of recent admissions to the institutions shows that practically no cases are admitted which cannot be regarded as urgent, and Dr. Smith can see no useful purpose in setting up machinery to control admissions. The report recommends, however, that a periodical survey of the inmates should be made, as old people are apt to remain in the sick wards when they might be transferred to the "house" or sent home. As regards the future, if fertility and mortality rates remain as they were in 1933 the number of people in Northants of 60 and over will increase from 30,000 in 1931 to 40,000 in 1985, while if the rates continue to decline as they have done in the last decade the number over 60 in 1985 will be about 50,000. Hence the demand on institutional beds is likely to increase still further during the next fifty years.

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PARLIAMENTARY INTELLIGENCE

INCURABLE INSANITY AS GROUND FOR DIVORCE

IN the House of Commons on May 17th an amendment to omit from the Divorce and Nullity of Marriage (Scotland) Bill the paragraph which empowers the Court to grant a decree of divorce on the ground that the defender is incurably insane was negatived. Miss HORSBRUGH said that if they included incurable insanity as a cause of divorce they would have divorce decided not on facts that could be substantiated in court but on the opinion of experts. The more they studied the question the more they were faced with the difficulty of defining incurable insanity. Cures were being carried out in cases which in the past would have been considered incurable. In 1936, 2583 people were received into mental institutions; 962 married people were received in that year, and 504 married people were discharged. The largest number of cures was in the first three years. Taking the figures for 1936, of the 504 people discharged as cured, 459 were discharged after less than three years; between three and five years there were 18; between five and ten years, 22; between ten and fifteen years, 3; and over fifteen years, 2. The greatest fall came after the ten years' period. Some people considered that after five years in an institution a person might be looked upon as almost incurable, but the figures did not bear out that view.

The greatest experts on mental disease would decline to say of a particular case that they were certain it was incurable. In the present Bill incurable insanity was presumed after five years in an institution unless evidence could be brought to rebut that assumption. In English law the method was the reverse: the petitioner had to prove that the person in the institution was suffering from incurable insanity. In that connexion great difficulties had been experienced in England, and she believed that there the law would be a dead letter because it was almost impossible to get medical experts to declare that the illness of a particular person was incurable. They were told that the Scottish Bill was an improvement on the English, but if that were so and more divorces would be granted under it, they ought to be careful to see that that did not happen through the person in the institution being deprived of proper facilities for defence. She would like to see someone appointed by the Court to look after the defender's rights. Many of the mental experts she had consulted considered that this measure would retard the recovery of persons suffering from mental illness. Dr. Henderson of Edinburgh said:

"I would plead especially for those patients who are on the verge of a breakdown, who fear unsoundness of mind and who would fear it still more if the possibility was present in their mind of being discarded and deserted by the one who was more nearly related to them than anyone else."

Would it not be well, Miss Horsbrugh asked, for Scotland to wait to see how the experiment worked in England?

Major NEVEN-SPENCE said he was certain that this particular part of the Bill did not command the support of the majority of people in Scotland. He had asked many alienists to draw up a list of incurable forms of mental disease and they had all declined to do so as it was quite impossible. The involutional illnesses affecting women at the menopause and rather later might go on for much more than five years and yet be completely cured. Then there were such forms of mental disorder as acute mania and melancholia, from both of which a person might recover, though both were liable to recur. Twenty years ago a diagnosis of paralysis of the insane was practically a sentence of death within a short term of years; to-day there were thousands of general paralytics going about doing their ordinary work. The paranoids, who, next to the dementia præcox group, formed the largest group in the mental hospitals, could and did recover to a remarkable extent under hospital régime and treatment. This Bill was typical of the approach of the legal mind to these problems. While lawyers talked in terms of lunatics and lunacy the medical profession thought in terms of illness characterised by confusions, delusions, exaltation and depression, loss of memory, and various other things which varied according to the different factors at work: it might be arteriosclerotic changes, toxic conditions, or states of stress and worry, or a host of physical and environmental causes. The legal mind seemed to regard insanity as a disease entity, much as one might regard cancer or diabetes. He objected to this proposal to treat insanity as a ground of divorce. Why should they stop at mental illness; why not drag in the tuberculous wreck, the diabetic, the sufferer from cancer, or a host of organic nervous diseases which interfered with the purposes of the marriage relationship just as much as insanity? Wild horses would not drag from him a certificate of incurable insanity in any circumstances whatever, and he believed that to be the feeling of the medical profession as a whole.

Mr. ERSKINE HILL said that the principal reason why insanity should be a cause for divorce was well set forth by the Divorce Commission. Dr. Robert Jones, upon whose evidence the commission based their report, said that insanity was a physical disease and a mental disability also. It was one moreover which deprived the sufferer of his liberty, and of his civil, social, financial, political, and even domestic rights; a person who was a chronic and incurable lunatic was for all practical and legal purposes dead. Some very striking figures were given to the committee which considered the English Bill. Sir Arnold Wilson had found that only 1 per cent. of the total number of people treated recovered after five years. Mr. Sorensen had put the figure at 0·5 per cent. These figures showed an enormous preponderance of cases which did not recover. As to the suggested deleterious effect of the Bill on insane persons, the majority report of the Royal Commission had said that this idea arose from omitting to consider that only incurable insanity, found to be such after a long period of confinement, would be likely to be recommended as a ground and that such a recommendation should remove any apprehensions with regard to those whose confinement is of short duration or whose cases have any reasonable prospect of recovery. The courts had expressed again and again in cases of judicial separation the evil effects of an enforced single life.

Mr. T. M. COOPER, Lord Advocate, said he thought it was obvious from the figures that the chances of recovery for a married lunatic who had been at least five years in an asylum were very small; something in the order of the ratio of 24 to 550. Whether the law of Scotland was left as it was, or not, there would be occasional very hard cases; that was unavoidable. The committee should discard the suggestions of the medical experts, and of those who were alleged to possess the legal mind, and consider the question from the standpoint of the man in the street. Apart altogether from questions of recovery after five years, was it or was it not socially desirable that a marriage which had been subject for so long a period as five years to the complete frustration of all the privileges of matrimony should be permanent?

NOTES ON CURRENT TOPICS

IN the House of Commons on May 20th the Children and Young Persons Bill was agreed to on Report and read the third time. On May 23rd the Housing (Rural Workers) Amendment Bill was read the third time.

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QUESTION TIME

THURSDAY, MAY 19TH

Cost-of-living Index for 1937

Mr. GEORGE GRIFFITHS asked the Minister of Labour the average cost-of-living index number for the year 1937 for rent, clothing, fuel and light, coal, gas, and miscellaneous items.—Mr. ERNEST BROWN replied: The averages of the percentage increases, over the level of July, 1914, recorded for the beginning of each of the twelve months of 1937 were as follows: rent (including rates) 59; clothing 102; fuel and light 78; coal 90; gas 48; miscellaneous items included in the index-number calculations 74.

Nutrition and Maternal Mortality

Miss WARD asked the Minister of Health if he could make any further report on the effect on maternal mortality of the special foodstuffs granted by the special commissioners through the National Birthday Trust Fund for expectant mothers.—Mr. ELLIOT replied: Particulars of results of this nutrition scheme, which is now being carried on by the Joint Council of Midwifery, covering the period from July 1st to Dec. 31st, 1937, have now been published. The following are the particulars:—

(*a*)= CASES RECEIVING SPECIAL FOODS. (*b*)= CASES NOT RECEIVING SPECIAL FOODS

Total No. of mothers (*a*) receiving food, and (*b*) not receiving food.	Puerperal death-rate from—		Total puerperal death-rate.	Maternal death-rate from associated causes.	Infant death-rate (stillbirth and neonatal).
	Sepsis.	Other causes.			
(*a*) 4446	Nil.	0·45	0·45	0·67	54
(*b*) 9040	1·77	1·77	3·54	1·33	83

Note.—All rates in the above tables are calculated per 1000 total births. These figures, which have been supplied by the medical officers of health of the areas concerned, are necessarily provisional.

Miss WARD: In view of the satisfactory results of the experiment may I ask what the next step is to be?—Mr. ELLIOT: We have to complete the experiment for which the Special Commissioner has given another £3000.—Miss WARD: When is the experiment likely to be over?—Dr. SUMMERSKILL: What is the reduction per 1000 of maternal mortality in these particular areas?—Mr. ELLIOT: Roughly speaking the total puerperal death-rate was 0·45 for those receiving foodstuffs and 3·54 for those receiving special food.

Bacteriological Standards for Milk

Mr. LIDDALL asked the Minister of Health if he was aware of the dissatisfaction felt by public health medical officers at the inadequate bacteriological standards for graded milks, and of their anxiety over the absence of any compulsory bacteriological standard for ungraded milk which was consumed by the vast majority of inhabitants of this country; and what steps, if any, he was taking to remedy this state of affairs.—Mr. ELLIOT replied: I am advised that the bacteriological tests prescribed for graded milks are adequate as a standard of cleanliness, but that a similar standard for all other milk is not practicable at the present time. I would, however, refer my hon. friend to the Government's proposals for promoting the cleanliness and purity of the milk-supply as set out in the White Paper on Milk Policy.

Experiments at Chatham Royal Hospital

Mr. LEACH asked the Home Secretary what was the nature of the research experiments carried out at Chatham Royal Hospital in connexion with testing the effects of high explosives, the number of animals used, the number killed, and the type or types of animals used.—Sir SAMUEL HOARE replied: I will send the hon. Member the particulars for which he asks.—Mr. RADFORD: Is it a sufficient answer to a question put down by an hon. Member of this House to say that the Minister will send a reply to the Member personally? May I submit, Mr. Speaker, that that does not give other hon. Members an opportunity of seeing an answer which may be of equal interest to all, and obviously in those circumstances the only thing to do would be for Members of the House to put down the same question on successive days.—Sir S. HOARE: May I say I have had some consultation with the hon. Member who put down this question which raises considerations of a very confidential character in connexion with these experiments. It was on that ground alone that I gave the answer to which the hon. Member refers—The Speaker said that he would not like to give a general ruling without regard to the particular nature of the question. He would not say that there might not be occasions when it would be necessary to take the course adopted by the Minister in this case.

National College of Physical Training

Major WHITELEY asked the Parliamentary Secretary to the Board of Education if he was now in a position to make an announcement as to the site for the National College of Physical Training.—Mr. KENNETH LINDSAY replied: Yes, Sir. My noble friend has considered a number of possible sites and has decided, in consultation with the National Fitness Council for England and Wales, that the most suitable site for the purpose is one of 220 acres situated on the Merstham Manor Estate, which, although only 17 miles from London, is in attractive open country adequately protected. I am glad to say that preliminary negotiations for the purchase of the site have been completed.

MONDAY, MAY 23RD

Patent Medicines

Mr. DAVID ADAMS asked the Minister of Health whether he was aware that in 1937 a Select Committee of the House of Commons estimated that the amount spent each year in the United Kingdom on patent medicines was between £20,000,000 and £28,000,000, as against an annual expenditure upon drugs under the national health insurance scheme of only £2,500,000; and whether, in view of this persistence of unskilled and often dangerous self-treatment, he would consider changes in the law whereby drugs sold under a proprietary name should at least be regulated as stringently as ordinary foods and drugs were under the Food and Drugs Act, 1875.—Mr. BERNAYS, Parliamentary Secretary to the Ministry of Health, replied: I am not sure exactly what change in the law the hon. Member has in mind, but I would refer him to Clause 6 of the Food and Drugs Bill now before Parliament which not only strengthens the present law regarding labels isued with drugs, but also applies to advertisements containing false descriptions of drugs or misleading statements as to their nature, substance, or quality.

Industrial Contributions to Hospitals

Mr. ROBERT GIBSON asked the Secretary to the Treasury when arrangements recently decided on for the system of collections for hospital fund purposes from industrial and non-industrial workers directly employed by the Government at Home, by arrangement with these workers by way of deduction from their pay, were likely to be completed; and if he could give an assurance that the contemplated central machinery would not involve a diminution of the funds collected from the workers for hospital purposes.—Captain EUAN WALLACE replied: It is hoped to bring this scheme into operation as from July 1st next. Contributions will be deducted free of charge by Government departments from the pay of their employees and transmitted to a committee of the British Hospitals Contributory Schemes Association for distribution to the appropriate hospital funds. The amount transmitted to any individual hospital fund will be the net amount after deduction of the expenses incidental to this distribution. It is estimated that after the first two or three years the expenses will not exceed 5 per cent. of the total receipts.

A Prisoner's Mental Condition

Sir JOHN MELLOR asked the Home Secretary whether his attention had been drawn to the evidence given at the trial of Bernard Anthony O'Sullivan, who pleaded guilty to a charge of attempting to murder a boy aged nine;

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whether he had investigated the allegation of the medical officer of Brixton Prison that, while at Broadmoor, O'Sullivan had declared that he thought it right to murder young children; whether he was satisfied that O'Sullivan's record and condition justified his release in 1935; and whether he would take more effective steps to prevent the release of dangerous criminals and lunatics.

Mr. SORENSEN asked whether the right hon. gentleman would make inquiries as to the reason for O'Sullivan's discharge from a mental hospital; and whether, in view of this man's record of mental instability, he would speedily have him transferred to Broadmoor or some other suitable mental hospital.—Mr. GEOFFREY LLOYD replied: In March, 1923, O'Sullivan was convicted of wounding with intent to murder and was sentenced to 10 years' penal servitude. While serving this sentence he showed no signs of mental abnormality and, having earned by good conduct and industry full remission marks, he was released in the ordinary course on licence in October, 1930. In April, 1932, he pleaded guilty at Manchester Assizes to a charge of larceny and was sentenced to three months' imprisonment, with the result that he became liable to serve in addition the remnant of his penal servitude sentence. At this time, he was found to be insane and he was transferred from prison first to Rainhill Mental Hospital, and subsequently to Broadmoor, where he remained until Jan. 16th, 1935, on which date his sentence expired. On the expiration of his sentence the powers and responsibilities of the Home Secretary with respect to his custody came to an end, but as he was still insane he become liable to detention under the ordinary provisions of the Lunacy law. Accordingly he was removed to Banstead Mental Hospital as a rate-aided patient. The question whether, and if so when, the patient should be discharged thereupon became one for the Visiting Committee of that hospital. Persons like O'Sullivan who are sentenced to some specified term of imprisonment or penal servitude are in a different position from persons who, when charged with a criminal offence, are found insane by the Court and ordered to be detained during His Majesty's pleasure. When a person is ordered to be detained during His Majesty's pleasure, the responsibility of deciding whether such a patient has sufficiently recovered to be released without undue risk rests on the Home Secretary. The decision in such a case is frequently a matter of great difficulty and, as is known to those hon. Members who from time to time make representations to the Home Office about the release of such patients, great care is taken to make all necessary inquiries and to weigh the various considerations which arise.

O'Sullivan is at present under careful observation in prison and if, as a result of that observation, he is certified to be insane, immediate steps will be taken for his removal to Broadmoor.

TUESDAY, MAY 24TH

Overcrowding in Glasgow

Mr. BUCHANAN asked the Secretary of State for Scotland the total number of houses in Glasgow which were occupied that were at present condemned either as being overcrowded or insanitary, or unfit for human habitation; and the total number of families which had been rehoused from houses in the above circumstances during the past twelve months.—Mr. WEDDERBURN replied: According to the report on the survey of overcrowding made by the corporation in the winter of 1935, which contains the latest available information on the subject, 74,952 houses in fit condition were then overcrowded. I am informed that 10,148 additional houses, still occupied, are on the corporation's list of insanitary houses to be dealt with under the Housing Acts as soon as alternative accommodation becomes available. With regard to the last part of the question, 3006 families have been rehoused from unfit or overcrowded houses during the past twelve months.

Impure Milk

Mr. WESTWOOD asked the Secretary of State for Scotland if his attention had been drawn to the report of the public health authority as to the filthy condition of milk being supplied to the Milk Marketing Board from the county of Angus; and, if so, what action he proposed to safeguard the health of the people from an impure milk-supply.—Mr. WEDDERBURN replied: I have seen a press report of a meeting of the public health committee of Angus County Council to which I presume the hon. Member refers. The milk referred to in the report was supplied by a single producer and is not now being accepted by the Board.

German Monopoly of Chemical Compounds

Mr. DAVID ADAMS asked the Chancellor of the Duchy of Lancaster, as representing the Lord President of the Council, whether his attention had been drawn to the fact that in case of war the British Empire would be without access to important chemical compounds of which Germany had a virtual monopoly; whether he was aware that German firms producing these chemical agents did not as a rule grant licences for manufacture in this country; and whether any Government action was contemplated in view not only of possible war-time contingencies, but also of the continuous and urgent needs of the British tropical Empire.—Earl WINTERTON replied: The Lord President is well aware of the fact that the discovery of new chemical compounds of certain kinds, particularly those which can be used in the treatment of some tropical and other diseases, at present depends largely on research work undertaken by industrial concerns in Germany, with the consequence that large supplies of these new substances can for a longer or a shorter period be obtained only from abroad. It is for this reason that the Government have approved the proposal of the Medical Research Council for expenditure at the rate of £30,000 per annum on research in chemotherapy, to enable this country to play a greater part in future in making new discoveries in this field.

In reply to a further question Earl WINTERTON said that since questions were asked on this subject about a week ago he had gone into the matter very carefully with the Lord President's Department and the Medical Research Council. There were other grants in connexion with this particular research in addition to this new sum of money which, in the first two years, would be largely expended in making new premises. The result would be greatly to enlarge the field of research. On the question of research he was satisfied, as was the Lord President, that sufficient was being done. The matter might be reviewed at some later date.

Scotland and Factory Regulations

Mr. ROBERT GIBSON asked the Home Secretary whether the regulations to be issued by the Home Office under the new Factory Act would apply directly to Scotland, or if a revised issue would be made from the Scottish Office applicable to Scotland; when the regulations would be available for Scotland; and if he had any statement to make on the subject.—Sir SAMUEL HOARE replied: Regulations under the Factory Acts are made by the Home Secretary for all parts of Great Britain, and are not separately issued from the Scottish Office. As regards the latter part of the question, I would refer the hon. Member to my reply on Thursday last. I have since approved the issue of further draft regulations in addition to those previously mentioned.

FOUNDERS DAY AT MANCHESTER UNIVERSITY.—The honorary degree of doctor of science was conferred on Sir Henry Dale on May 18th by the chancellor, Lord Crawford, during the celebration in Manchester of the hundredth year of local government. In presenting Sir Henry Dale to the chancellor, Prof. T. W. Manson referred to work done "in the dark, unexplored places where physiology, biochemistry, and pharmacology meet," and of its benefit, actual and potential, to mankind at large. And Sir Henry Dale, in reply, spoke of the unique opportunity of medical research in the fullest sense awaiting endowment at Manchester "by some fairy godfather or syndicate of fairy godfathers." In Manchester, if anywhere, he said, were conditions for the growth of a great centre of medical research. At Oxford, before the princely endowment of research, it had been needful for the benefactor first to create in the environs of that ancient city a great industry and industrial population. Manchester had no need to begin by creating an industrial population for its purpose; it already had a great hospital devoted to the medical care of the dense population which industry had created around it.

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CAMPAIGN AGAINST MALNUTRITION

ON May 14th the Children's Minimum Council held a provincial conference at Newcastle-upon-Tyne attended by over 600 people, among whom were delegates from 214 organisations in Northumberland and Durham, including 23 local authorities. In an opening address the LORD MAYOR spoke of the right of every individual to full health, and said he hoped the conference would hasten the pace of the drive for improved nutrition.

Prof. V. H. MOTTRAM gave a theoretically good "minimum" diet for correct nutrition (for an adult male) as follows:—

	per day.
5 oz. cheese at 8*d.* lb.	2½*d.*
2 lb. 3⅛ oz. bread (brown) at 2½*d.* lb. ..	5*d.*
4 oz. cabbage (raw) at 3*d.* lb.	½*d.*
	8½*d.* { (4*s.* 9½*d.* a week).

He pointed out that even if one could bear the monotony of this diet, it would be almost impossible to digest. He quoted Sir John Orr's estimate that over 4½ million people (including a quarter of the children of Great Britain) spend less than 4*s.* per week on food. Their diet must be deficient in every constituent. "It is the mothers and children who suffer most," he declared. "By the time the children come under the care of the education authorities they are already damaged goods. If we could only feed the children and the expectant mothers, we should do much to produce a decent nation."

The Ven. L. S. HUNTER, archdeacon of Northumberland, referred to the necessity of achieving adequate wages as well as higher unemployment allowances. It was necessary to think also of the human personality, a problem which could not be solved unless we thought of building up the whole life of the people.

At the second session, over which Prof. DAVID BURNS presided, Miss ELEANOR RATHBONE, M.P., chairman of the Children's Minimum Council, said that the main points of the Council's programme were adequate unemployment allowances, free milk for all school-children, cheap milk for mothers and children under five, and school meals as a part of the school routine; it was held that the major part of the cost of free milk and meals should be borne by the National Exchequer. The main excuse given for scales inadequate to meet minimum needs was that in the case of families with several children they would exceed wage-rates in unskilled occupations. This unfortunately was true, but the objection was met, in the case of the Unemployment Assistance Board, by the rule that the scale payments must not exceed the normal earnings of the recipient. Miss Rathbone personally believed that the only permanent remedy for this difficulty was to supplement wages with family allowances. Otherwise, there must always be a discrepancy between wages, which bear no relation to the size of the family, and any kind of assistance which does bear such a relation. Meanwhile the Council went on pressing for higher rates, but also pressed for communal services in kind, in such a way as to supplement the incomes of the unemployed and the lower-paid wage-earners alike.

The Council also asked that "a daily ration of fresh, clean milk should be made available, free of cost, to all children attending (*a*) public elementary, and (*b*) State-aided secondary schools, both on school days and holidays." At present milk was not supplied free, but at ½*d.* for a third of a pint, and only about half the elementary school population were receiving it. This modest success was largely due to the fact that the increased consumption of milk was also desired by the farmers and the milk industry. The usual reason given why more children did not buy milk was that they did not like it. No doubt the milk habit did take some time to spread among children who had not been used to milk at home, but recent experimental schemes showed that the excuse that they do not like milk was often given in order to conceal the fact that their parents could not afford to pay for it. In Merkinch school, Inverness-shire, free milk was provided for all scholars by the Inverness-shire county council. Only 12 children out of 770 did not take it. The fact that some children paid for their milk, while others did not, made the whole scheme troublesome to the teachers and it had a taint of charity about it which deterred parents and children. The only way to ensure that the children who needed milk got it was to provide free milk for all school-children.

But even if the milk scheme were developed to the utmost, it would not remedy the dietary deficiency. Children could not live by milk alone. The Council had devoted special attention to the question of school meals, and it was startling to find how little progress had been made since pre-war days. It appeared that the number of children who received meals during the year had not increased since 1911. At any one time during the year only about 2 per cent. of the school population got solid school meals. The taint of charity hung about meals as well. Often they were provided only for those who could not pay, and parents who were proud and self-respecting did not like to apply for them. The Children's Minimum Council considered that the school meal should be provided as an ordinary part of the school routine. Children need not take them unless they wanted to, but they should be encouraged to do so and made to feel that it was the normal thing. At present the Board of Education tried to insist on a medical test before the granting of school meals and milk free, but there was no recognised standard for medical officers to work on and in estimating malnutrition there was a real danger that the average might be taken as the standard. Many doctors had emphasised how difficult it was to discover from a single physical examination whether or not the health of a child was being impaired by malnutrition, and careful observers might come to entirely different conclusions. The system was most unsatisfactory and the medical test should be replaced by an income test. An inquiry made by the Council, which covered 939 children whose parents were members of unemployed clubs in various districts, showed that two-thirds of these (over 600) were getting neither free milk nor free meals. Sweden had just decided to provide a free meal for all school-children, and if Sweden could afford to do this, surely England could afford it too. Many local authorities were putting forward ambitious school-building programmes which included no dining-rooms or canteens even for the senior schools. This was singularly short-sighted because even if we could not afford to provide a free meal for everyone now, we hoped it might be possible within the next fifty years. Miss Rathbone urged that some of the milk now sold at 5*d.* and 6*d.* a gallon for manufacturing should be diverted to the needs of the mothers and children, and suggested the formation of a local committee to continue the pressure on the Government through all Northumberland and Durham organisations, and added: "In tackling the Government, you need to combine the methods

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of the importunate widow, the ancient mariner, and Sisyphus."

In the discussion that followed Miss Rathbone's speech it was proposed that the supply of free meals should be taken out of private hands, that universal nursery schools should be provided to remedy the malnutrition caused by the gap of two years between the time when children leave the child welfare clinic (at 3) and the time when they start school (at 5), and that all scholarship students should be granted free meals and clothing.

Dr. GERTRUDE HICKLING agreed with Miss Rathbone that there was no standard of values on which medical officers could assess malnutrition, and that the economic standard was the only reliable basis to work on. By the time there was evidence of malnutrition it was often too late. She referred to the experiment in Walker-on-Tyne, arranged by the Milk Marketing Board and the Commissioner for the Special Areas, by which pregnant and nursing mothers and children under five could buy milk for 2*d.* a pint. The scheme was a great success. The medical officers in the area had also been told that they might give free milk where wages were very low.

OBITUARY

DR. WADE FROST

THE death at Baltimore early this month of Dr. Wade Hampton Frost, professor of epidemiology at Johns Hopkins, has severed a rather intimate international connexion, for Frost was a teacher of world-wide influence. He died in the Johns Hopkins Hospital of cancer of the œsophagus at the age of 58. Son of Dr. Henry Frost of Charleston, S.C., a surgeon in the Confederate army, Wade Frost was brought up in Virginia, graduating there in arts in 1901 and medicine two years later. In 1905 he joined the U.S. Public Health Service and from 1909 to 1913 initiated the studies on the epidemiology of poliomyelitis, diphtheria, and tuberculosis, on which he worked throughout his life. For a while he was in charge of the river pollution laboratory at Cincinnati, but when the U.S.A. came into the war he was called to direct the bureau of sanitary service of the American Red Cross. In 1919 he joined the newly organised school of hygiene at Johns Hopkins, becoming its first resident lecturer and later professor of epidemiology. He finally retired from the official public health service to become dean of the school. At the time of his death he was serving one State as consultant in stream pollution, another as referee in tuberculosis, and a third in measures for the control of pneumonia. His death has left a deep sense of loss at Johns Hopkins, where he was valued not only for his clear and logical method of reasoning, but for his subtle and penetrating wit, and an austere sense of duty. One line of appreciation may be quoted here: "No one can recall the mean or malicious as his contribution in any relationship."

JOHN ANDERSON, C.I.E., M.B. Edin.

Colonel Anderson, who died on Sunday at Hyde Park Gate in his eighty-fourth year, was one of the best known and best loved members of the Indian Medical Service. Born at Inch, Co. Donegal, in 1855, he entered the I.M.S. in 1878 and served through the second Afghan campaign. After being transferred to civil employment he held surgeoncies at Simla and Lucknow, and was for some years principal of the Agra medical school. Before the exact causes of cholera and other plagues were fully known he was a pioneer in measures for their control. His services as a surgeon, and not least as an oculist, were also in request throughout the United Provinces. He was a born organiser and administrator, and his help was sought in providing relief during many famines in India. A colleague writes of him as "one of the most charming personalities that had ever been known in the city of Lucknow. He was a great sportsman and big game hunter, and was in demand at all social functions for his wit and bonhomie. After his retirement he never missed the annual dinner of the I.M.S. in London and was always called to draw on a fund of stories that never ran dry." Colonel Anderson married first the daughter of J. B. N. Hennessey, C.I.E., F.R.S., and after her death in 1924 the widow of Surgeon-General J. Cleghorn, C.S.I., who survives him.

MEDICAL NEWS

University of Oxford

Dr. R. H. S. Thompson has been elected to the Radcliffe medical fellowship and praelectorship in medical science at University College, Oxford.

The board of the Faculty of Medicine has given notice of the following altered regulations for the examination in human anatomy for the First M.B., to take effect from Jan. 1st, 1938:—

"The examination will include (*a*) a written paper and (*b*) a practical and viva voce examination. Three hours will be assigned to each part.

"In the written examination, candidates will be expected to show their acquaintance with the structure of the human body, including general topography; the gross and minute anatomy of organs and tissues, with special reference to processes of growth, development, and structural adaptation; human embryology; and neurological anatomy.

"In the practical and viva voce part of the examination candidates will be required to show their knowledge of human anatomy by reference to dissected material; to recognise and describe microscopical and embryological specimens, normal radiographs, and special dissections; and to give evidence of their acquaintance with surface anatomy on the living subject."

University of Cambridge

Three assistants in research to the regius professor of physic will shortly be appointed to hold office from Oct. 1st. They will be assistant in research in radiology (diagnostic), assistant in research in psychiatry, and assistant in research in pathology (morbid anatomy and histology). The first appointment will carry a salary of £600 a year and each of the other two of £500 a year. The appointments will be made for three years in the first instance. Further information may be had from the secretary of the appointments committee of the faculty of medicine, department of pathology, Tennis Court-road, Cambridge, to whom applications should be sent not later than July 1st.

National University of Ireland

It has been decided to confer the hon. degree of M.Ch. on Mr. E. E. Ware.

Royal Society of Medicine

An award of the Norman Gamble prize will be made in October.

This prize, which is of the value of £50, is awarded every four years for the best original work in otology carried out since the last award. Applications should be sent to the secretary of the Society, 1, Wimpole-street, London, W.1, not later than Sept. 30th.

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University of London

Mr. G. R. de Beer, D.Sc., has been appointed to the university readership in embryology tenable at University College. For the last eleven years he has been Jenkinson lecturer in embryology and senior demonstrator in zoology and comparative anatomy in the University of Oxford.

The degree of D.Sc. in biochemistry has been conferred on Mr. W. T. J. Morgan.

Society of Apothecaries of London

The following candidates have satisfied the examiners for the Mastery of Midwifery :—

H. R. England, R. S. Cromie, Louise Alice Matheson, and Sumitrabai Shrikhande.

At recent examinations the following candidates were successful :—

Surgery.—A. Backman, Guy's Hosp.; F. E. Buckler, Lond. Hosp.; R. M. Corker, Guy's Hosp.; P. H. Hay-Heddle, Westminster Hosp.; T. E. Ooi, Univ. of Oxon. and Guy's Hosp.; and C. L. Summerfield, Univ. of Leeds.

Medicine.—W. H. Bayley, St. Thomas's Hosp.; P. C. Conran, Univ. of Camb. and Middlesex Hosp.; O. H. Galloway, Roy. Colleges, Edin.; J. C. B. Nesfield, Univ. of Camb. and St. Mary's Hosp.; T. E. Ooi, Univ. of Oxon. and Guy's Hosp.; and C. Webb, St. Bart.'s Hosp.

Forensic Medicine.—P. C. Conran, Univ. of Camb. and Middlesex Hosp.; O. H. Galloway, Roy. Colleges, Edin.; J. C. B. Nesfield, Univ. of Camb. and St. Mary's Hosp.; T. E. Ooi, Univ. of Oxon. and Guy's Hosp.; and C. Webb, St. Bart.'s Hosp.

Midwifery.—C. V. Arthur, St. Mary's Hosp.; R. M. Corker, Guy's Hosp.; J. C. Gregory, Univ. of Camb. and St. Bart.'s Hosp.; C. R. Morgan, Guy's Hosp.; C. L. Summerfield, Univ. of Leeds; and W. E. Swanston, St. George's Hosp.

The following candidates, having completed the final examination, are granted the diploma of the society entitling them to practise medicine, surgery, and midwifery :—

W. H. Bayley, A. Backman, F. E. Buckler, P. C. Conran, O. H. Galloway, P. H. Hay-Heddle, J. C. B. Nesfield, T. E. Ooi, and C. L. Summerfield.

University of Liverpool

Dr. T. B. Davie, professor of pathology in the University of Bristol, has been appointed to the George Holt chair of pathology in succession to Prof. J. H. Dible, who is now professor of pathology in the British Postgraduate Medical School.

Dr. Davie, who is 42, graduated in arts at the University of Stellenbosch, South Africa, in 1914. During the war he served with the Royal Air Force and in 1918 he returned to South Africa where he held the post of science master in various schools. He returned to this country in 1924 and studied medicine at Liverpool. He graduated with first-class honours in 1928, and after holding resident posts at the Royal Infirmary was appointed junior lecturer in pathology in the university in 1929. In 1931 he obtained his M.D. degree and the membership of the Royal College of Physicians of London. In the same year he was appointed pathologist to the Corporation Hospital, and two years later he returned to the University of Liverpool as senior lecturer in pathology. He held this post till he was appointed to the chair at Bristol in 1935. Dr. Davie has published papers on medullo-epitheliomas of the brain and retina; on adenolymphoma of the salivary gland; and on renal rickets.

The title of professor of tropical diseases of Africa has been conferred on Dr. T. H. Davey while holding the directorship of the Sir Alfred Lewis Jones research laboratory, Sierra Leone.

Dr. Davey graduated M.B. at the University of Belfast in 1925 and obtained the degree of M.D. with commendation in 1934. He has previously held the posts of research assistant and assistant director at the laboratory.

Research Defence Society

The annual Stephen Paget lecture will be delivered to this society at the London School of Hygiene, Keppel-street, W.C., on Thursday, June 9th, by Prof. Charles Best, F.R.S. He will speak on insulin and diabetes.

National Fitness Council for England and Wales

This council has set up a medical committee "to take such action as may be found desirable in order to enlist the coöperation of the medical profession in promoting the policy of the council; and to consider and report on the medical aspect of the council's work." The following have been appointed members: Lord Dawson (chairman), Sir Kaye le Fleming, Dr. Adolphe Abrahams, Dr. Anna Broman, Dr. George Chesney, Dr. G. E. Friend, Major A. H. A. Gem, Dr. J. A. Glover, Dr. Haden Guest, Dr. L. P. Lockhart, Captain J. G. Paterson, Dr. J. R. Rees, and Miss P. Spafford.

Surgeon Rear-Admiral Leonard Warren, O.B.E., has been appointed honorary physician to the King.

Colonel R. N. Chopra, F.R.C.P., professor of pharmacology and director of the School of Tropical Medicine in Calcutta, has been elected an hon. fellow of the American Society of Pharmacology and Experimental Therapeutics. This is only the fourth time this honour has been awarded to someone who is not an American.

Welsh National School of Medicine

Dr. W. H. Tytler has been appointed to the David Davies professorship of tuberculosis in succession to Prof. Lyle Cummins, who is to retire in September. Dr. Tytler is at present research bacteriologist to the Welsh National Memorial Association.

National Association for the Prevention of Tuberculosis

Mr. Walter Elliot, the new Minister of Health, will open the annual conference of this association on June 30th in place of Sir Kingsley Wood. The conference is being held at B.M.A. House, Tavistock-square, London, W.C.

Indian Medical Service

The annual dinner of the service will be held at the Trocadero Restaurant, London, on Tuesday, June 14th, at 7.15 P.M., when Major-General E. W. C. Bradfield will preside. The Marquess of Zetland, Secretary of State for India, will be the guest of honour. Tickets may be had from the hon. secretary, Major Sir Thomas Carey Evans, Hammersmith Hospital, Ducane-road, London, W.12.

International Congress of Surgery

The German Surgical Society, to which most of the Austrian members of the International Society of Surgery belong, is at present in collaboration with the Viennese committee, making arrangements for this congress, which is to take place in Vienna from Sept. 19th to 22nd. The following subjects will be discussed: Surgical treatment of hypertension, bone-grafts, and surgical treatment of pulmonary cysts and tumours. Nearly 200 speakers have promised to take part. On the occasion of this congress the Messageries Maritimes are organising a cruise, which will leave Marseilles on Sept. 4th and will give surgeons the opportunity to attend operative demonstrations at Naples, Athens, Istanbul, Odessa, Bucharest, and Budapest. The cruise is due to reach Budapest on Sept. 18th in time to reach Vienna at 5.25 P.M. that day. Further information may be had from Prof. G. Grey Turner, British Postgraduate School, Ducane-road, London, W.12. Messrs. Thos. Cook and Sons are responsible for the travel arrangements.

Royal Institute of Public Health and Hygiene

A congress will be held by this institute at Blackpool from May 31st to June 4th under the presidency of Lord Cozens-Hardy. The work will be divided into five sections, which will meet concurrently. In the section of State medicine and industrial hygiene Dr. C. O. Stallybrass and Dr. H. G. Smith will discuss changing views as to the spread of infections. The second session of the section of women and children and the public health will be devoted to a discussion on the new maternity services, which will be opened by Dr. Andrew Shinnie, Prof. A. Leyland Robinson, Dr. J. A. Longworth, and Miss A. L. Culverhouse. During the proceedings of the section of tuberculosis there will be a symposium on tuberculosis in relation to the pneumonoconioses in which Dr. H. Midgley Turner, Dr. W. E. Cooke, and Dr. J. V. Sparks will take part. In his presidential address to the section of rheumatism and allied diseases Sir Morton Smart will speak on muscle action in relation to repair of joint tissue, and Dr. W. S. C. Copeman, Dr. C. W. Buckley, and Dr. F. M. Hilliard will sponsor the treatment of arthritis in the hospital, in the spa, and in the home respectively. In the section of nutrition and physical training Dame Louise McIlroy will discuss the dietary of the expectant and nursing mother, and Dr. Bernard Myers that of the infant and toddler. Mr. Leslie Harris, Sc.D., will speak on the assessment of malnutrition, and Dr. David Haler will describe laboratory aids to its assessment Further particulars may be had from the secretary of the institute, 28, Portland-place, London, W.1.

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Royal Society

Prof. J. J. Abel, M.D., director of the laboratory for endocrine research at the Johns Hopkins medical school, Baltimore, has been elected a foreign member of this society.

The National College of Physical Training

A site at Merstham in Surrey has been selected for this college, which is to be erected under the Physical Training and Recreation Act for the training of teachers and leaders. It consists of 220 acres on the Merstham Manor estate on the North Downs, being about a mile north of Merstham station and three miles from Redhill and South Coulsdon stations.

Demonstrations of Contraceptive Technique

On Thursday, June 2nd, at 2.30 P.M., a practical demonstration of the technique of the use of a variety of contraceptive methods will be given at the C.B.C. Clinic by Mrs. Marie Stopes, D.Sc., and Dr. Evelyn Fisher. Medical practitioners and senior students should apply for tickets to the hon. secretary of the clinic, 108, Whitfield-street, London, W.1.

Appointments

BURT, H. A., M.B. Camb., Chief Assistant in Department for the Treatment of Chronic Rheumatic Diseases at the West London Hospital.

LYON, D. M., M.B. Edin., Assistant School Medical Officer and Assistant to the Medical Officer of Health for Brighton.

MAY, K. S., M.D., M.R.C.P. Lond., D.L.O., Senior Assistant Medical Officer (Grade I) at St. George-in-the-East Hospital (L.C.C.).

ROGERS, T. S., M.D., M.R.C.P. Lond., D.P.H., D.C.H., Assistant Medical Officer in the L.C.C. School Medical Service.

SMITHIES, BEATRICE M., M.R.C.S. Eng., D.P.H., Assistant Medical Officer in the L.C.C. School Medical Service.

WOODMAN, DOROTHY, M.D. Lond., Senior Clinical Pathologist in the department of preventive medicine of the University of Bristol.

London County Council.—The following part-time consultants and anæsthetists have lately been appointed:—

BROWN, A. I. P., M.B. Lond., D.A.;
COGSWELL, A. P. L., M.B. Lond.;
DAVIES, H. W., B.A. Oxon., L.M.S.S.A.;
DODWELL, H. B., B.Chir. Camb.;
EDWARDS, GEORGE, M.R.C.S. Eng., D.A.;
GOULD, R. B., M.B. Sheff., D.A.;
HADFIELD, C. F., M.D. Lond., D.A.;
HASLER, J. K., M.B. Lond., D.A.;
KERRIDGE, ALISON R., M.R.C.S. Eng., D.A.;
LANDAU, ERNEST, M.R.C.S. Eng., D.A.;
MACHRAY, ROBERT, M.B. Lond.;
MORRIS, L. H., B.A. Camb., M.R.C.S. Eng.;
PALMER, E. A. E., M.B. Camb., D.A.;
PRATT, F. H., M.R.C.S. Eng., D.A.;
SEYMOUR, E. A., M.B. Lond.;
VESSELL, V. E., M.R.C.S. Eng.;
WILLIAMS, MARIAN E., M.R.C.S. Eng.; and
TAYLOR, EDITH M., M.B. Lond.

London County Council Hospital Staff.—The following appointments, promotions, and transfers are announced. A.M.O. (I) or (II) = Assistant Medical Officer (Grade I or II):—

NIXON, W. C. W., M.D. Lond., F.R.C.S. Eng., M.C.O.G., Part-time Obstetrician and Gynæcologist, Fulham and St. Mary Abbots;
BATTEN, GRACE, B.M. Oxon., D.M.R.E. Camb., Full-time Radiologist, Fulham, St. Luke's, Chelsea, St. Mary Abbots, and St. Stephen's;
MACKAY, HELEN M. M., M.D., F.R.C.P. Lond., Part-time Consulting Pædiatrist, Queen Mary's, Carshalton and Downs (Children);
WILLIAMS, A. R., M.B. Liverp., Senior A.M.O. (II), Grove Park;
MCCREA, A. N., M.B. Camb., F.R.C.S. Eng., A.M.O. (I), Bethnal Green;
FAUX, NANCIE I., M.B. Lond., A.M.O. (II), Fulham;
COLLIN, J. O., M.B. Camb., A.M.O. (II), Highgate;
MILLAR, A. M., M.B. Melb., A.M.O. (II), Queen Mary's, Sidcup;
ROGERS, J. G., M.B. Liverp., A.M.O. (II), St. Charles';
MCCLELLAND, MARGARET, M.B. Melb., A.M.O. (II), St. Giles';
KENNEDY, J. P., M.B. N.Z., A.M.O. (II), St. Peter's;
HAYES, R. R. C., M.B. Melb., A.M.O. (II), St. Mary, Islington;
MURRAY, H. S., M.B. Glasg., A.M.O. (I), Park;
WHITE, EVA M., M.R.C.S. Eng., D.M.R.E., Part-time Consulting Radiologist, Queen Mary's, Carshalton;
NICHOLAS, F. G., M.B. Lond., D.M.R.E., Part-time Consulting Radiologist, Dulwich;
SEYMOUR, S. G., M.B. Irel., A.M.O. (I), St. Peter's;
MAY, QUEENIE I. E., M.B. Lond., A.M.O. (II), St. Mary, Islington; and
WOLFSON, L. J., M.R.C.S. Eng., A.M.O. (II), Lambeth.

Certifying Surgeon under the Factory and Workshop Acts: Dr. S. BEDFORD (Ulceby District, County of Lincoln).

Vacancies

For further information refer to the advertisement columns

Barry U.D.C.—Surgeon for Accident and Surgical Hosp., £800.
Bolton Royal Infirmary—Asst. Res. Surg. O., £200.
Bradford Children's Hosp.—H.S. and H.P., each £150.
Brighton, New Sussex Hosp. for Women.—H.S. and H.P., each at rate of £100.
Brighton, Royal Sussex County Hosp.—Hon. Clin. Asst. to Early Nervous Disorders.
Brighton Sanatorium and Infectious Disease Hosp.—Jun. Res. M.O., at rate of £250.
Brighton, Sussex Eye Hosp.—H.S., at rate of £150.
British Postgraduate Medical School, Ducane-road, W.—Three H.S.'s, each at rate of £105.
Bury St. Edmunds, West Suffolk General Hosp.—H.S. and H.P., £180 and £150 respectively.
Cambridge, Addenbrooke's Hosp.—Res. Anæsthetist and Emergency Officer, at rate of £130.
Cambridge University, Dept. of Medicine.—Three Assts. in Research to the Regius Professor of Physic, £600, £500, and £500.
Cardiff, King Edward VII Welsh National Memorial Assn.—Asst. Res. M.O. for South Wales Sanatorium, £200.
Carnarvonshire and Anglesey Infirmary, Bangor.—Jun. H.S., £120.
Charing Cross Hosp., W.C.—Asst. Obstet. Phys.
Chelsea Hosp. for Women, Arthur-street, S.W.—Surgeon. Also Jun. H.S., at rate of £100.
Cheltenham General and Eye Hosp.—H.P. and Two H.S.'s to Special Depts., each £150.
Chesterfield and North Derbyshire Royal Hosp.—H.S., at rate of £150.
Colonial Medical Service.—M.O. for Zanzibar, £600.
Connaught Hosp., Walthamstow, E.—Res. Surg. Reg. and Cas. O., at rate of £200 and £110 respectively.
Coventry City Joint Pathological Lab.—Asst. Pathologist, £500.
Derbyshire Education Committee.—Asst. School M.O., £500.
Dewsbury and District General Infirmary.—Second H.S., £150.
Doncaster, St. Catherine's Certified Institution.—Res. Med. Supt., £950.
Dreadnought Hosp., Greenwich.—H.P. and H.S., each at rate of £110.
Dundee, University College.—Full-time Asst in Dept. of Anatomy, £250.
East Ham Memorial Hosp., Shrewsbury-road, E.—H.S. to Spec. Depts. and Cas. O., at rate of £120.
Elizabeth Garrett Anderson Hosp., Euston-road, N.W.—Hon. Asst. Physician. Hon. Asst. Psychiatrist to Out-patient Dept. Also Med. Reg., £100.
Evelina Hosp. for Sick Children, Southwark, S.E.—Aural Surgeon, 50 guineas.
Golden Square Throat, Nose, and Ear Hosp., W.—Hon. Asst. Surgeon. Also Clin. Assts.
Grimsby and District Hosp.—Res. Orthopædic Officer, £225.
Halifax Royal Infirmary.—H.P., £175.
Herefordshire County Council.—County M.O.H., £1000.
His Majesty's Colonial Service.—Health Officer for Jamaica, £600.
Hosp. for Sick Children, Great Ormond-street, W.C.—Asst. Res. Surg. O., £100.
Hosp. for Women, Soho-square, W.—Hon. Clin. Assts. to Surgeons in Charge of Out-patients. Also Res. M.O., at rate of £100.
Huddersfield Royal Infirmary.—H.S. to Special Depts., at rate of £150.
Hull Municipal Maternity Home and Infants Hosp.—Jun. Res. M.O., at rate of £100.
Ipswich, East Suffolk and Ipswich Hosp.—H.S. to Orthopædic and Fracture Dept., £144.
King Edward Memorial Hosp., Ealing.—H.S., at rate of £150.
Lancaster Royal Infirmary.—H.S., at rate of £130.
Leicester City Mental Hosp., Humberstone.—Locum Tenens Asst. M.O., 8 guineas per week.
Leicester Royal Infirmary.—Res. Radiologist, at rate of £200.
Lincoln County Hosp.—Jun. H.S., at rate of £150.
Lincolnshire Joint Board for the Mentally Defective.—Temporary Superintendent.
Liverpool, County Mental Hosp., Rainhill.—Locum Tenens Asst. M.O., 8 guineas per week.
Liverpool Royal United Hosp.—H.P. and H.S., each at rate of £100.
London Chest Hosp., Victoria Park, E.—H.P., at rate of £100.
London County Council.—Res. Medical Superintendent, £950. Also Asst. District M.O., £240.
London Homœopathic Hosp., Great Ormond-street, W.C.—H.S., at rate of £100.
London Hosp., E.—Med. First Asst. and Reg., £300.
London University.—University Chair of Radiology, £1500.
Maidstone, Kent County Ophthalmic and Aural Hosp.—Ophth. H.S., at rate of £200.
Manchester, Ancoats Hosp.—Chief Asst. O. to Orthopædic Dept., £150.
Manchester Royal Infirmary.—Jun. Asst. M.O. in Radiological Dept. and Chief Asst. to Neuro-Surgical Dept., each £350.
Manchester, Victoria Memorial Jewish Hosp., Cheetham.—Hon. Gynæcological Surgeon.
Marie Curie Hosp., 2, Fitzjohn's-avenue, N.W.—Res. M.O., £100.
Mildmay Mission Hosp., Austin-street, E.—Asst. Cas. O. and Jun. Res. M.O., at rate of £125 and £100 respectively.
National Hosp. for Diseases of the Nervous System, Queen-square, W.C.—H.P., £100.
Newcastle-upon-Tyne Eye Hosp.—Hon. Ophth. Surgeon.
Northampton General Hosp.—Hon. Physician and Hon. Asst. Physician to Dept. of Psychological Medicine.
Norwich, Norfolk and Norwich Hosp.—H.S., £120.

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Oxford, Radcliffe Infirmary.—Hon. Physician and Hon. Dermatologist. Also Surg. Reg., £100.
Pembroke County War Memorial Hosp., Haverfordwest.—Res. H.S., £200.
Plymouth, Mount Gold Orthopædic and Pulmonary Tuberculosis Hosp.—Res. M.O., £300.
Princess Elizabeth of York Hosp. for Children, Shadwell, E.—Out-patient M.O., at rate of £175. Also H.S., at rate of £125.
Princess Louise Kensington Hosp. for Children, St. Quintin-avenue, W.—H.P., at rate of £120.
Putney Hosp., Lower Common, S.W.—Res. M.O., £150.
Queen's Hosp. for Children, Hackney-road, E.—H.P., at rate of £100. Also Ophth. Surgeon and Vacancy in Dept. of Psychological Medicine.
Royal London Ophthalmic Hosp., City-road, E.C.—Pathologist and Curator, £200. Also Refraction Asst. to L.C.C. School Dept., £160.
Royal Naval Medical Service.—Medical Officers.
Royal Society of Medicine, 1, Wimpole-street, W.—Norman Gamble Fund and Research Prize, £50.
St. Albans, Hill End Hosp., &c.—H.P., at rate of £165.
St. George's Hosp., S.W.—Res. Anæsthetist, at rate of £100.
St. Helens Hosp., Lancashire.—Sen. H.S., £225.
St. John Clinic, &c., Ranelagh-road, S.W.—Med. Reg., £200.
St. Mark's Hosp. for Cancer, &c., City-road, E.C.—H.S., at rate of £120.
St. Mary's Hosp., W.—Third Asst. Pathologist, £250. Also Anæsthetist in Dental Dept., £1 per session.
St. Mary's Hosp. for Women and Children, Plaistow, E.—Res. Surg. O. and Res. H.P., at rate of £155 and £150 respectively.
St. Paul's Hosp. for Urological and Skin Diseases, Endell-street, W.C.—H.S., at rate of £100.
St. Peter's Hosp. for Stone, Henrietta-street, W.C.—Clin. Assts. to Hon. Staff.
Salford Royal Hosp.—Two H.S.'s, each at rate of £125.
Salvation Army, Mothers' Hosp., Lower Clapton-road, E.—Sen. and Jun. Res. M.O.'s, at rate of £150 and £80 respectively.
Sheffield, Jessop Hosp. for Women.—Sen. Res. Officer and H.S., at rate of £150 and £100 respectively.
Sheffield Royal Infirmary.—Clin. Asst. to Ophth. Dept., £300. Also Ophth. H.S., at rate of £150.
Sheffield University.—Demonstrator of Anatomy, £300.
Shrewsbury, Royal Salop Infirmary.—Res. H.S., at rate of £160.
South London Hosp. for Women, Clapham Common, S.W.—H.P. and H.S., each at rate of £100.
Southwark Metropolitan Borough.—Part-time Asst. Tuber. O., £350.
Sudan Medical Service.—Vacancy, £E720.
Sunderland County Borough Mental Hosp.—Med. Supt., £1000.
Sunderland Royal Infirmary.—H.P., £120.
Tilbury Hosp.—H.S., at rate of £140.
Wakefield Mental Hosp.—Asst. M.O., £350.
Warlingham Park Hosp., Surrey.—Sen. Asst. M.O., £600.
Warneford Hosp., Oxford.—Physician Supt., £1000.
Westminster Hosp. Annexe, 66, Fitzjohn's-avenue, Hampstead.—Radiologist.
West London Hosp., Hammersmith, W.—Two Cas. O.'s, each £250. Also H.P. and Two H.S.'s, each at rate of £100.
Weston-super-Mare Hosp.—Res. H.P., £150.
Willesden General Hosp., Harlesden-road, N.W.—Hon. Clin. Assts. to Out-patient Dept.
Winchester, Royal Hampshire County Hosp.—Res. Surg. O., at rate of £200.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Taunton (Somerset) and Tyldesley (Lancs).

Medical Diary

May 30th to June 4th

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY.

Pathology. 8.30 P.M. (National Institute for Medical Research and Imperial Cancer Research Fund Farm Laboratories, Mill Hill, N.W.). J. Argyll Campbell: (1) Mouse Liver with ? Inclusion Bodies. (2) Mouse Lung Cancer with Metastases. Sir Edward Mellanby: (3) Experimental Production of Deafness in Young Animals. A. S. Parkes: (4) Effects of Hormones on the Fowl. R. Knox: (5) Lesions Produced in Rats by Woglom's Pyogenic Virus. J. E. Barnard: (6) Microscopical Demonstration of Woglom's Virus in Rat Lesions. W. Cramer and E. S. Horning: (7) Pituitary Changes Produced by Œstrin. L. Foulds: (8) A Transplantable Guinea-pig Carcinoma Produced by Thorotrast. R. J. Ludford: (9) The Growth Characteristics of Some Filterable and Non-filterable Fowl Tumours in Tissue Cultures. (10) The Action of Leucocytes ("trephones") on the Growth of Fibroblasts *in vitro*.

WEDNESDAY.

Surgery. 2.15 P.M. (Addenbrooke's Hospital, Cambridge). Dr. L. B. Cole: Tetanus. Dr. A. S. Griffith: Bovine Tuberculosis.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.

WEDNESDAY.—8.30 P.M. (Kensington Town Hall), Sir William Willcox: Toxicology with reference to its Criminal Aspects. (Cavendish lecture.)

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.

TUESDAY.—5 P.M., Prof. F. R. Fraser: The Clinical Aspects of the Transmission of the Effects of Nervous Impulses by Acetylcholine. (Last Croonian lecture.)

UNIVERSITY OF LONDON.

MONDAY and WEDNESDAY.—5.15 P.M. (University College, Gower-street), Prof. F. Weidenreich: *Sinanthropus pekinensis.*

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane-road, W.

TUESDAY.—4.30 P.M., Dr. H. Gardiner-Hill: Diseases of the Ductless Glands.
WEDNESDAY.—Noon, clinical and pathological conference (medical). 2 P.M., Mr. G. A. D. Haslewood, D.Sc.: The Cerebro-spinal Fluid. 3 P.M., clinical and pathological conference (surgical). 4.30 P.M., Prof. J. C. Drummond, D.Sc.: Practical Aspects of Modern Vitamin Research
THURSDAY.—2.15 P.M., Dr. Duncan White: radiological demonstration.
FRIDAY.—2 P.M., clinical and pathological conference (obstetrics and gynæcology).
Daily, 10 A.M. to 4 P.M., medical clinics, surgical clinics and operations, obstetrical and gynæcological clinics and operations.

ST. MARY'S HOSPITAL, W.

TUESDAY.—5 P.M. (Institute of Pathology and Research), Prof. Matthew Stewart: Some Aspects of the Silicosis Problem.

ST. GEORGE'S HOSPITAL, S.W.

MONDAY.— 5 P.M., Sir Frederick Hobday: A Comparison of Diseases in Animal and Man. (First of six lectures.)
THURSDAY.—5 P.M., Dr. E. Guttmann: psychiatric demonstration.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.

THURSDAY.—2 P.M., Sir Lancelot Barrington-Ward: Peritonitis. 3 P.M., Dr. R. T. Brain: Ringworm.
Out-patient clinics daily at 10 A.M. and ward visits at 2 P.M.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY to SATURDAY.—CHELSEA HOSPITAL FOR WOMEN, Arthur-street, S.W., all-day course in gynæcology.—BROMPTON HOSPITAL, S.W., Tues. and Fri., 5.15 P.M., M.R.C.P. course in chest diseases.—NATIONAL TEMPERANCE HOSPITAL, Hampstead-road, N.W., Tues. and Thurs., 8 P.M., clinical and pathological M.R.C.P. course.—LONDON CHEST HOSPITAL, Victoria Park, E., Wed. and Fri., 6 P.M., M.R.C.P. course in heart and lung diseases. (Open only to members of the fellowship.)

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James' Hospital, Ousley-road, S.W.

WEDNESDAY.—4 P.M., Dr. C. P. Symonds: The Clinical Significance of Headache.

Births, Marriages, and Deaths

BIRTHS

ABERCROMBIE.—On May 23rd, at Fitzjohn's-avenue, Hampstead, the wife of Dr. G. F. Abercrombie—a daughter.

BALDWIN.—On May 14th, at Edinburgh, the wife of Dr. John T. Baldwin—a daughter.

WOOD-SMITH.—On May 19th, at a London nursing-home, the wife of Dr. F. G. Wood-Smith—a daughter.

MARRIAGES

CURRAN—GOTHARD.—On May 21st, at St. Paul's, Knightsbridge, Desmond Curran, F.R.C.P., to Marquerite Claire, only child of Mr. Claude Gothard, of Beckenham, Kent.

KERSHAW—GUY.—On May 18th, Kenneth Clifford Kershaw, M.R.C.S., Tattenhall, Cheshire, to Jessie Louise Guy, Rushall, Walsall.

LEVIS—TALL.—On April 23rd, at St. Andrew's Church, Kowloon, Hong Kong, Lieut. Derek George Levis, M.B., R.A.M.C., to Doris Constance Tall, niece of Mr. T. Young Simpson, F.R.C.S.

PILKINGTON—VON WESTHOVEN.—On May 21st, at St. John's Church, Merrow, Francis Edward Pilkington, M.R.C.P., to Elizabeth, elder daughter of the late General Eduard von Westhoven.

DEATHS

ANDERSON.—On May 22nd, at Hyde Park-gate, S.W., Colonel John Anderson, C.I.E., M.B. Edin., late I.M.S., aged 83.

BENNETT.—On May 21st, Colonel Vivian Boase Bennett, F.R.C.S. Eng., I.M.S. (retired), of Castletown, Isle of Man.

CASE.—On May 20th, at Southsea, Hugh Martin Case, M.R.C.S Eng., of Fareham, Hants.

WARD.—On May 22nd, at Ipswich, Frank Fowler Ward, M.B. Camb.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

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NOTES, COMMENTS, AND ABSTRACTS

APPENDICITIS THIRTY AND FORTY YEARS AGO *

By G. L. THORNTON, M.C., T.D., M.A., M.R.C.P.
COLONEL (T.A.), RETIRED

THE material used in the preparation of this address has been drawn mainly from published reports of the proceedings of the Devon and Exeter Medico-Chirurgical Society during an association dating back to 1902. My object in resurrecting matter engaging our interest twenty-five to forty years ago and more has been to see how far modern progress in diagnosis and treatment, and in the technique associated with these, would have affected the end-results obtained at those distant dates.

In the change of outlook that has taken place since the war we have but shared in an experience common to every department of our life. In our own case the spread and perfecting of specialism, the rapid growth in the insurance and health services, and better facilities for the transport of the sick to hospital have combined to cause an easing of personal responsibility. Summed up with little need for metaphor we seem to see in the post-war era the transition from manual to mechanised medicine.

* * *

Just thirty years ago the society was indebted to Mr. A. C. Roper for a very instructive and dramatic paper with the title: The Last Chance—does it still exist? At that date the loss of time in travelling and the absence of any special transport for the sick, very often meant delay in obtaining consultative advice or removal to hospital. The result was a "wait and see" attitude in abdominal conditions very different from the "open and see" policy that followed. Mr. Roper was expounding the advantages of the more radical outlook, and he urged that where any suspicion of an intra-abdominal catastrophe arises—be it perforation, hæmorrhage, or internal strangulation—the longer operation is delayed the greater is the danger until at last a stage is reached where operation itself is unjustifiable. This view will find none to challenge it to-day; it is however in the attitude towards appendicitis that senior members of the society must have observed oscillation of the pendulum.

Looking back forty years one remembers the "quiescent interval" in which it was hoped recovery would take place—as indeed it often did. In the less favourable case there was the waiting for the inflammatory area to be shut off and for an abscess to be opened in the right iliac fossa about the second week. Many of these, alas, did not progress according to expectation, and operation was performed at a time when the "last chance" had wellnigh ceased to exist. In the cases operated upon for abscess the after-progress was often slow and wearing to the patient. In many instances, beyond the portion of appendix evacuated with the abscess no further removal could be attempted. In some of these there was recurrence of abscess at a later date, or more immediate complications such as perforations into the bladder, vagina, or rectum; perirenal abscess and empyema were not unknown as later incidents.

Mr. Roper, in support of the early operation, quoted the following figures of Mr. A. H. Burgess of Manchester, published in the *British Medical Journal* in January, 1908:—

		Cases.	Deaths.
Operation where symptoms were found—	under 24 hours	7	0
	24 to 48 „	9	0
	on third day	14	0
	on fourth „	15	0
	on fifth „	10	2
	on sixth „	6	2
	on seventh „	5	1
	second week	21	3
	third „	13	1

In commenting he mentioned a conversation he had had with Mr. Mayo Robson of Leeds some years prior to 1908, in which the latter had said, "I have often had to regret that my operation was too late; never that it was too early."

One remembers also the period when a daily blood count was taken as a guide. It was by no means always a certain one—as for instance when a previous attack with adhesions circumscribed the inflammation.

I say this, however, without prejudice to an investigation whose value cannot be over-estimated in any routine clinical examination; for to the hæmacytometer, as to the hand-centrifuge in the microscopical examination of urinary deposits, many an obscure case owed solution at a time when special laboratory facilities were not at our door.

Four years earlier Mr. Russell Coombe had opened a discussion and without committing himself one way or the other had given the indications for immediate operation as opposed to awaiting a quiescent interval. These were: (1) in acute cases where reasonable doubt existed as to localisation; (2) a belief that pus has formed; and (3) the existence of peritonism.

How far we were influenced by that address from Mr. Roper, or to what extent there was general amendment in surgical opinion is uncertain; but the practice arose of calling in the surgeon at the earliest possible moment wherever appendicitis was seen or suspected. Nor did we find occasion for subsequent regret in the part we had taken in precipitating operation. The late Mr. Brennan Dyball, who was becoming known to us at this period, had no misgivings on the subject, as indeed was his opinion clear on so many problems where others might see cause for halting.

A few years ago it seemed that again some hesitation was taking place as to immediate operation in appendicitis; but a surgical friend tells me that the pendulum had merely quivered, and that it now stands firm. This seems only reasonable when we consider a condition where so much uncertainty and potential danger is concealed from view. I remember on more than one occasion our old friend Dr. Langridge of Ilfracombe reminding us of "the writing on the abdominal wall"; but I venture to think that even the greatest Daniel amongst us may fail to interpret the message correctly in every case of appendicitis.

* Part of a valedictory address entitled Some Bygone Numbers in the Light of To-day, delivered before the Devon and Exeter Medico-Chirurgical Society on the completion of 27 years' service as reporting honorary secretary (March 31st, 1938).

THE GROWTH OF NAILS

IN the department of human anatomy at Oxford Prof. W. E. Le Gros Clark and Dr. L. H. Dudley Buxton have been making observations on the growth of finger-nails in normal adults and children (*Brit. J. Derm.* May, 1938, p. 221). It seems that

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covariance between the nail-growth of one digit and that of all the others is high, that the growth of the nail on the third digit is consistently greater than that of the others, while the little finger-nail is consistently the least rapidly growing. The thumb-nail apparently grows slightly less rapidly than those of the index and ring-fingers. As might be expected, finger-nails grow more rapidly in summer than in winter, and the habit of nail-biting also accelerates growth. On the negative side, these observers found no difference in rate of nail-growth between the right and left hand and no variation of growth with age between the ages of 10 and 23.

FRIENDLY HELP

ALL of us need help sometimes and we find it difficult to have to ask it of strangers. It is the claim of the Ladies' Guild of the Royal Medical Benevolent Fund that their beneficiaries are made to feel they are being helped by friends who take a real interest in their welfare. The twenty-eighth annual report of the Guild tells of another year's work during which 526 people were helped. In addition to the £3477 distributed, 500 orders for coal were issued and 584 parcels of clothes were sent out. Seven new branches have been opened, and the treasurer reported a slight increase of income which enabled the Guild to cope with an increased number of requests for help. The reports of the various committees show how intelligent giving can increase the value of the gift. Coöperation with other organisations, for example, often makes it possible to arrange a really constructive scheme to help a beneficiary, which the Guild could not have carried out alone. This is perhaps most easily seen in the work among the young people. The education and training section last year helped 27 boys and 40 girls in schools all over the country, and 7 boys, 13 girls, and 1 widow were also given the chance to train in self-supporting careers. Those who read this report will feel that the Guild is certainly fulfilling its aim to bring back independence to those who are young enough to have an independent future and to give friendship and some measure of comfort to the old and infirm. Those who cannot offer any other form of gift can surely spare clothes, discarded while still in good condition. These should be sent to the clothes room of the Guild, Tavistock House North, Tavistock-square, London, W.C.1.

RECREATION IN INDUSTRY

IT is a vexed question whether the interests of health and recreation are better served by employers providing sports facilities or by the community allotting the necessary space and equipment to be used by groups of workers at fees provided in whole or in part by their own sports clubs. Obviously where space is limited the multiplication of private clubs may be wasteful; community sports centres could allot more equitably the available accommodation. The question of Sunday opening, which so vexes small clubs and many sports associations in industry, might be more readily solved within the larger unit, although one knows of areas where the public grounds are closed and the private grounds are open. By whatever method sports facilities are organised the essential thing is to benefit the greatest number of people, and provided this is borne in mind the method is of secondary importance. Credit should however be given to industrial concerns which have, in many cases at considerable outlay, contributed to the country's sports facilities. It has been a piece of first-rate public hygiene and the next step is to fuse private and public effort into an effective and widespread system. To this end the Industrial Welfare Society has brought out an attractive booklet entitled Recreation in Industry (18, Hobart-place, London, S.W.1. 1s.). It is a good example of the wedge of private enterprise driving a channel for the full flow of public effort. Apart from the actual provision of equipment, no one has any doubt that works sports clubs should be widely encouraged; the more numerous and the more varied the better, making use at a small fee of publicly provided equipment. The country should not be covered with a host of little sports fields which are allowed to remain idle when schools and other institutions could be using them. Swimming baths, holiday hostels, riding clubs, and a variety of other expensive recreations can only be widely enjoyed when resources are pooled or when the community provides the equipment which local clubs can hire. The business of providing recreational facilities demands large-scale planning and the booklet is a very interesting commentary on the amount of coördination that is still necessary.

HARLOW BROOKS

IN an age of specialism there are probably many who regret the passing of the old-fashioned general physician whose place has been so largely taken by the team of experts. Harlow Brooks, the subject of a biography [1] by his friend, Dr. John J. Moorhead, belonged to, and adequately represented, a type of consultant with which, fortunately, we have not yet grown unfamiliar in this country. A man of wide rather than narrowly specialised medical education and knowledge, energetic, conscientious, and bonhomous, he was profoundly interested in sick humanity and never spared himself in its service. For forty years he was an outstanding figure in the New York medical world and this book, the writing of which has obviously been a labour of love, will appeal to medical readers not because it tells a story of extraordinary medical ability and experience, but rather because it portrays a physician of a particularly sound and lovable kind.

BRUSH UP YOUR HEALTH

SMALL chatty books on health are now so common that it is easy to make the mistake of ignoring an exceptional one.[2] Though Dr. Clegg makes his subject amusing he does not make it too simple; there is no aura of "told to the children" about it. He seems to have decided that if people want to know about their health they had better realise from the start that the subject is complicated, and that a great many facts must be taken in and assimilated. He sets about giving those facts so precisely, and yet so pleasantly, that the reader finds himself taking the trouble to understand them before he knows he has been lured into a laborious task. He is full of sound advice about diet, about the care of the eyes and teeth, and the dangers (and delights) of tobacco and alcohol. His summary of the principles of self-analysis (under the title "On bringing up yourself") is masterly considering the short compass into which it is compressed, and full of common sense. He does not see us—even the best of us—as well-meaning angels, overthrown by circumstances. "You are, of course," he says, "an over-inhibited and repressed savage. It is really only but a short time ago that you were pursuing your next cave neighbour with the laudable intention of cracking his head; and there was still the evening meal to kill in order to celebrate the event. . . . An emotion well under way needs for its satisfaction expression in muscular activity. Anger should logically (and psychologically) end up in a well-planted blow. Hate needs a little homicide to keep it quiet." He goes on to praise the advantages of ball games as an outlet for aggression. "Is not the golf ball a convenient symbol for the head of the man who did you such a dirty deal last week?" He ends with a most encouraging chapter urging us to get back to Methuselah and live longer lives; which, it seems, we are quite capable of doing if we will only give our minds to it.

[1] Harlow Brooks, Man and Doctor. By John J. Moorhead, M.D. London: Harper and Bros. 1937. Pp. 302. 10s. 6d.

[2] Brush Up Your Health. By H. A. Clegg, M.B., M.D. M.R.C.P., with a preface by Lord Horder, G.C.V.O. London: J. M. Dent and Sons, Ltd. 1938. Pp. 119. 6d.

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DESTRUCTION OF RABBITS WITH VIRUS

INFECTIOUS myxomatosis of rabbits was described by Snarelli as early as 1898 when it broke out among his laboratory rabbits in Montevideo. The disease is severe and usually fatal to members of the genus oryctolagus, though other animals appear insusceptible to it. Experiments with the virus carried out a few years ago by Sir Charles Martin, F.R.S., on rabbits in grassed compounds suggested that a virulent strain was remarkably stable and that the very few animals which recovered did not transmit immunity to their offspring. The use of the disease as a means of controlling rabbit populations is examined by A. N. Worden in the Animal Year Book,[1] but cannot be unreservedly recommended. H. O. Schmit-Jensen of the State Veterinary Serum Laboratory, Copenhagen, who is in charge of an island experiment not yet completed, writes that "the procedure is an extremely economical one but I ought to say that I do not find it as humane or æsthetic as could be desired." Another observer who is also in charge of an island experiment considers that on waste-land, such as islands or cliffs, where it is uneconomic to pay men to catch rabbits, the use of the virus is justified because it causes a less painful and quicker death (8–16 days) than the slow starvation which every winter brings on these sites. The 1937 report of the Skokholm Bird Observatory describes an unsuccessful attempt to eradicate with the virus the wild rabbits on this island off the Pembrokeshire coast. Three times at intervals of months infected rabbits were released, and though for a while the disease was observed to spread, and it is admitted that almost all the infected rabbits died, there were always some, even in heavily infected areas, which remained immune. At the time the report was written the rabbit population seemed as large as ever and the virus appeared to have died out altogether from the island.

AFTER DINNER REST AWHILE?

IN 1909 five members of our profession, including Sir Thomas Barlow and Sir William Hale-White, started a correspondence in the *Times* by saying that "school and cross-country races exceeding one mile in distance are wholly unsuitable for boys under the age of nineteen, as the continued strain involved is apt to cause permanent injury to the heart and other organs." In the discussion that followed among medical officers of schools, the majority agreed with Sir Clifford Allbutt, who declared he had never had reason to suppose that any particular harm had been done by exercise.[2] This is still the general opinion, and nowadays the discussion rather turns on what and when a boy should eat before the race. Mr. M. C. Nokes[3] extols the virtues of "full-sized helpings of Irish stew and boiled potatoes, followed by suet pudding and golden syrup" at a meal finishing an hour and a half before the contest. The consumer of this fare, he says, finished seventh out of a field of 46 starters in the Ledbury run at Malvern College, which may be regarded as one of the stiffer of the public school cross-country runs. Two of Mr. Nokes's colleagues have countered by pointing out that all the competitors who finished in the first five places consumed a very light luncheon, consisting of either a small portion of fish or a poached egg; but on the other hand Mr. Montague relates that twenty years ago he won the Crick run at Rugby, which is something over 12 miles, after eating precisely the same meal as Mr. Nokes's boy, with the sole difference that he had two helpings of each dish, enjoyed the meal and the race, and rounded off the afternoon by consuming seven oranges. The *Rugby School Meteor* records that a high wind was blowing; otherwise the record of 1 hr. 12 min. 12 sec. might have been broken by Montague, who took 57 sec. over that time.

No wonder we still talk with envy of the schoolboy's digestion. Although, in almost all schools, football, cricket, or hockey are not played until at least an hour after the end of dinner, the keenest boys rush from their meals and are often playing squash racquets within a quarter of an hour of finishing the meal. A sustained game of squash lasting half to three-quarters of an hour can be as exhausting as an ordinary game of Rugby football; yet no apparent harm seems to come of this practice and it is argued that these habits of boys do no damage to them either then or later.

A great deal depends on habit, and the observations of Campbell and his assistants[4] upon the influence of exercise on digestion show how important the effects of "training" may be. They estimated the emptying-rate of the stomach and the secretion of gastric juice during rest and after varying degrees of exercise, and found that though severe exercise always delayed the rate of emptying and inhibited the secretion of juice, the amount of activity needed to bring this about depended on the men's fitness. Light exercise such as walking did not delay the secretion of gastric juice, and it increased the rate of emptying, especially when the walk was a pleasurable one with a friend. Although in one of their subjects walking quickly for an hour was enough to delay digestion, in another, whose habit it was to run several miles a day, running two miles was not enough. As the meals had to be withdrawn through a Ryle's tube, they were not "solid," and would certainly not have satisfied the ordinary schoolboy's appetite. Exercise that produced no discomfort helped digestion, while exercise that caused discomfort hindered it.

RELIEF IN PROSTATIC ENLARGEMENT.—Messrs. Mottershead and Co. (7, Exchange-street, Manchester, 2) have submitted a contrivance for the passage of a weak electrical current through the enlarged prostate in elderly patients. It consists of two dry-cell batteries connected by leads, with one electrode to be inserted in the rectum, the other to receive the glans penis. Evidence has been offered that a continuous current of this kind may reduce the spasm of the sphincter and relieve discomfort. The price of the apparatus is £5.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED MAY 14TH, 1938

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 1; scarlet fever, 2154; diphtheria, 998; enteric fever, 14 (27 "expected"); pneumonia (primary or influenzal), 1188; puerperal pyrexia, 179; cerebro-spinal fever, 29; acute poliomyelitis, 5; encephalitis lethargica, 7; dysentery, 49; ophthalmia neonatorum, 95. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on May 20th was 4504, which included: Scarlet fever, 843; diphtheria, 1070 (carriers 53); measles, 1364; whooping-cough, 275; puerperal fever, 14 mothers (plus 8 babies); encephalitis lethargica, 281; poliomyelitis, 1. At St. Margaret's Hospital there were 24 babies (plus 7 mothers) with ophthalmia neonatorum.

Deaths.—In 126 great towns, including London, there was no death from small-pox, 1 (0) from enteric fever, 28 (11) from measles, 3 (1) from scarlet fever, 20 (6) from whooping-cough, 32 (8) from diphtheria, 47 (16) from diarrhœa and enteritis under two years, and 54 (11) from influenza. The figures in parentheses are those for London itself.

Southend-on-Sea reported the only death from typhoid. Measles proved fatal in 17 great towns, Gateshead having 2 deaths, no other great town more than 1. Birmingham reported 6 deaths from whooping-cough, Liverpool 2. Diphtheria was fatal in 19 great towns, Liverpool reporting 3 deaths. The number of stillbirths notified during the week was 309 (corresponding to a rate of 42 per 1000 total births), including 39 in London.

[1] Animal Year Book, 1938, vol. v, p. 75 (published by the University of London Animal Welfare Society, 42, Torrington-square, W.C.1, 2s. 6d.).

[2] See Jubilee report of Medical Officer of Schools Association, 1934, p. 34.

[3] *Times*, March 26th, 1938, p. 8.

[4] Campbell, J. M. H., Mitchell, G. O., and Powell, A. T. W., *Guy's Hosp. Rep.* 1928, 78, 279.

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ADDRESSES AND ORIGINAL ARTICLES

CAUSATION AND TREATMENT OF DERMATITIS*

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IF we choose to examine a classified list of patients suffering from skin disease who have attended the out-patient department of any general hospital, we shall find a striking preponderance of cases under the heading "dermatitis"; and dermatitis, in its broad sense, probably exercises the ingenuity and patience of the physician more than any other group of skin diseases.

Dermatitis is a comprehensive term: it is characterised by polymorphic lesions in which papules or vesiculæ may predominate; or the only clinical signs may be a diffuse redness; or not infrequently all of these may be present together. The variations depend upon factors such as the type, concentration, and duration of the contact of the irritant; also on accessory influences due to infection and remedies which have already been applied. Unfortunately the objective signs give little indication of the causation, and the determination of the ætiology is largely dependent on a detailed history of the sequence of events which preceded the onset of the dermatitis.

Confusion has arisen in the minds of many regarding the distinction between dermatitis and the older term eczema, and as eminent writers differ in their interpretation of the word eczema, the perplexity is understandable. Indeed, some dermatologists go so far as to abolish eczema from their vocabulary. In order to simplify the issue I will endeavour to explain what the term dermatitis may imply. It is, of course, an inflammatory reaction of the skin which may arise from a wide variety of causes, but it is not sufficiently appreciated that there is a considerable difference in the individual resisting power of the skin. One person can tolerate a certain strong irritant on the skin with impunity, whereas another apparently healthy man or woman cannot. Actually, the resisting power of the skin may be estimated fairly accurately by the following simple procedure. Turpentine or some other irritant is applied in various dilutions to the skin for 24 or more hours. It is found that some skin will tolerate a mixture of 75 per cent. turpentine in olive oil without any evidence of a reaction, whereas another may have a reaction with 55 per cent. concentration in the same length of time. Skin contact applications are now widely used as a means of detecting the cause of dermatitis, and are known as "patch tests." The suspected substance, either full-strength or diluted, is applied to the skin, usually on a fragment of gauze 1 cm. square. This is covered with a similar-sized piece of Cellophane and fixed to the skin. At the same time it is advisable to apply a saline control in the vicinity. Examination of the skin should be made in 24 hours, but occasionally the reaction is delayed for two or more days. The test is not infallible but is nevertheless of great value, and the time may come when advantage will be taken of this test in selecting workers for various trades.

Individuality has also an important bearing on the origin and course of dermatitis, for scratching or rubbing due to lack of self-control may change a trivial localised patch of inflammation into a generalised dermatitis which may cripple the patient for many months.

Recognising the important rôle which low-grade physical and mental resistance may play, we can consider a simple classification which for convenience may be shown diagrammatically as follows:

DERMATITIS.

(1) Traumatic dermatitis.	(3) Atopic dermatitis (infantile eczema and sequelæ).	(2) Sensitisation dermatitis (often referred to as eczema).

Traumatic dermatitis is the inflammatory reaction of the skin following application of an external irritant, for instance a mustard leaf. It often arises after contact with acids, alkalis in certain trades, also soft soap and other domestic irritants. The term is sufficiently comprehensive, for under "trauma" we may include even sunburn and inflammation following contact with organisms. The most familiar example the practitioner has to deal with is the unfortunate woman with red œdematous weeping hands who spends a considerable proportion of her day over a wash-tub, or in scrubbing floors. There comes a time when the alkali in soap and in washing powders destroys the horny layer of her skin more quickly than it can be replaced—the result is the dermatitis. Strange to say, she is the last person to recognise the cause, for she is obsessed with the idea that some evil has entered her circulation which necessitates the ingestion of the appropriate "blood mixture."

Removal of the cause is obviously the scientific method of treating all forms of traumatic dermatitis, but it is not always a simple matter, for it may interfere with the means of earning a livelihood. However, with a little common-sense such a misfortune may often be obviated. For instance, rubber gloves may be worn for short periods when immersion of the hands in irritating fluids is necessary. In addition, wearing cotton gloves during the remainder of the day preserves the skin from irritants such as heat, cold, and grime, and thus allows repair of the tissues. Smearing a mixture of equal parts of lanoline and wax on the exposed area before commencing work is another means of protecting the skin. The application of spirit, or 5 per cent. solution of tannic acid twice daily will harden the skin. It is imperative that patients should realise that protection is the essential treatment, not only from any particular irritant which has been responsible for the breakdown of the skin, but from all others. Merely washing once or twice a day with soap and water may prolong indefinitely a dermatitis which has been excited by some other irritant.

The longer a dermatitis is allowed to continue, the more sensitive the skin becomes, and the longer time it requires to recover; it is therefore important that the cause should be removed with the least possible delay. In my experience there is a tendency to continue working, even though the signs have been recognised, presumably with the hope that the skin may recover without enforced rest—a most improbable event.

SENSITISATION DERMATITIS

I will now pass on to consider that interesting form of dermatitis which we know as sensitisation dermatitis. The clinical appearance and histological changes

*An address given to the Huddersfield Medical Society, Dec. 8th, 1937.

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are similar in many respects to the reaction which follows trauma, but the mechanism differs. In order to explain the pathology of the reaction it is convenient to take as an example the well-recognised primula dermatitis. We are indebted to Dr. Cranston Low for a description of an interesting experiment which he performed on himself some years ago (Low 1924). He scraped the skin of his forearm and rubbed into it the crushed leaf of the plant; this was not followed by any inflammatory reaction. Three weeks later he again rubbed the leaf into the same site, and on this occasion an intense reaction followed within 12 hours. Before commencing the experiment he could handle the primula or rub the leaf on his skin with impunity. Thus he succeeded in sensitising his skin to the primula, and like most gardeners who have been sensitised to the plant, he remains susceptible. Many other plants and grasses including the daffodil, feverfew, and particularly the popular chrysanthemum, have the same property of exciting a dermatitis in a sensitised individual, even when minute quantities of the substance are carried by the hands or clothing of a third person. I recall the case of a patient who sustained a dermatitis of the face and neck after contact with the hands of a nurse who had previously arranged some primula blooms in the sick-room. And as long ago as 1898 Sir Arthur Hall recorded a case of recurring attacks of dermatitis due to sensitisation to phenylhydrazine hydrochloride. On two occasions a relapse followed the short visit of a third person who had been working with this substance.

Similarly the skin may become sensitised by a large number of substances met with in certain trades (e.g., the baker from contact with dough); by various chemical substances contained in ointments; by fabric dyes; by cosmetics such as hair dye, lip-stick, face-powders; and by the following antiseptics—picric acid, boric acid, and flavine. Even as a sequel to exposure to sunlight the skin may become sensitive. I have already mentioned that sunburn is regarded as a traumatic dermatitis, but we know by experience that a return to normal surroundings is followed by complete recovery of the skin, until the next visit to the sea-side. On the other hand, the person who has become sensitised by exposure to sunlight is so intolerant that a few minutes' subsequent exposure to bright daylight at home may cause a painful reaction, and the sufferer may have no alternative but to stay indoors, except in the evenings, during the summer-time. This intolerance to the shorter light waves is usually acquired after a prolonged exposure to sunlight. It is interesting to note that individuals in this unfortunate predicament are protected by window glass, for ordinary plate glass acts as an efficient filter of ultra-violet light.

Primarily, a traumatic dermatitis is limited to the area of the skin which has been in contact with the particular irritant, but a sensitisation dermatitis is inclined to spread, and even involve distant skin surfaces. Many practitioners will recall the onset of a dermatitis on the face and neck following the application of some unsuitable ointment to an ulcer on the leg. The tendency to involve distant areas of skin may even be seen after traumatic dermatitis, provided the trauma has been sufficiently prolonged. In such a case the skin has probably become sensitised by some product of inflammation in the injured skin, and this has been transported by the blood to other sites. Another important fact is that sensitisation to one substance not infrequently leads to sensitisation to others, and consequently gives rise to further difficulties in the treatment.

So far I have confined my remarks to sensitisation dermatitis produced by the external contact with chemical substances, but it is probable that the same phenomena may follow the infection of the skin by certain organisms, which accounts for the train of events in seborrhœic dermatitis, and in some forms of dermatitis associated with interdigital dermatitis of the foot.

Again, although all the examples quoted have referred to sensitisation by the external route, most authorities think that the skin may become sensitised by chemical substance, food, toxin, or organisms reaching it by means of the blood stream. Thus injection of Salvarsan, whether intravenous or intramuscular, is followed in a small proportion of cases by a dermatitis which may be very intractable or even fatal. Another example is dermatitis following the application of iodine to the skin and iodism when it is administered orally. In this connexion may be mentioned the increased sensitivity of the skin to sunlight in persons suffering from a deficiency of vitamins, as is seen in the typical dermatitis on the dorsa of the hands and other exposed parts in cases of pellagra.

ECZEMA

Referring to the diagram, it will be noted that sensitisation dermatitis is also bracketed as eczema and many physicians believe that this very common eruption of the skin can be satisfactorily accounted for by a sensitisation of the skin from either external or internal causes. Other authorities invoke in addition a morbid predisposition which is usually acquired following digestive disturbance, endocrine abnormalities, metabolic disorders, focal sepsis, and psychological upset; but it is significant that eczema is rarely met with in the patients suffering from the above diseases, who crowd the medical out-patient and wards of the hospitals in this country. It must be agreed that the pathology of the so-called predisposition is by no means satisfactorily explained. The exciting cause of the onset of the primary lesion is often a degree of trauma or infection which is inoffensive to a normal individual. In many instances it gives rise to a circumscribed group of papules on a red œdematous base. Within a few hours the papules become vesicles which are soon replaced by pin-head-sized crusts of dried serum. The lesions may extend in an irregular fashion locally, and characteristically other lesions appear on distant areas of skin without any apparent cause. No part of the skin is exempt from manifestations, and the rash may be vesicular, erythematous, dry, scaly, or lichenfied. The distribution of this polymorphic rash is variable; it may or may not be symmetrical, and unless there is infection by organisms there is no adenitis. It is at times associated with persistent insomnia, and not infrequently with nervous depression. The multiplicity of the occasional causes suggest that it is a syndrome and not a morbid entity, the predisposition being the common factor. Chronicity is a characteristic feature, for it is apt to recur for one or more years.

The relationship between eczema and industrial dermatitis is of growing interest. MacCormac (1937) has pointed out recently that the age of incidence of idiopathic eczema and of industrial dermatitis, particularly in males, has a very similar curve. Unfortunately there is no pronounced clinical distinction between the two types, so the experienced examiner relies largely on a well-balanced history and meticulous attention to detail to guide him in deciding the ætiology.

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ATOPIC DERMATITIS

For some years there has been a feeling that infantile eczema and the sequelæ—flexural eczema and prurigo—should be regarded as an entity and be distinguished from other eczemas; and in the United States it is now customary to refer to the group as manifestations of the atopic state. The name serves to stress the distinction and is becoming more widely adopted. The state of atopy includes not only dermatitis, but also predisposition to a particular type of allergy, the sufferers from which are liable to attacks of asthma, hay-fever, migraine, and other conditions. The desirability of separating this type of eczema from others is supported by the fact that in a considerable proportion of cases, if not in all, it is a familial disposition. The first male child appears particularly liable to be affected by this peculiar state, and Rogerson (1937) has drawn attention to certain personality characteristics such as over-anxiety and restlessness, which are common to most atopic children. In addition he points out that the average intelligence of the atopic child is measurably higher than that of the normal child.

It must be clearly understood that infants, like their elders, are equally, if not more, liable to suffer from dermatitis caused by trauma such as friction, chemical irritants, or infection by organisms, and this type of dermatitis must be distinguished from the atopic variety which usually begins as an intractable papular vesicular eruption on the cheeks during the early months of life. It may remain localised to the face or scalp, but there is a tendency to generalisation and polymorphosis.

There is the consolation that many infants recover entirely from atopic dermatitis during the second year of life, but unfortunately about 20 per cent. develop the eruption in the flexures, particularly the antecubital flexures, the wrists, the popliteal spaces, and around the neck, and the rash may recur off and on for many years with or without other manfestations of the atopic state. In a small proportion of cases the rash during infancy is slight, or non-existent, yet it appears during adolescence in the form of the adult type, which is characterised by intensely itchy papules and dry thickened skin affecting the flexures, face, and upper third of the chest and back. Trauma plays an important rôle as an exciting cause of the primary outbreak of the eruption. Sir Arthur Hall (1905) pointed out that in the great majority of cases of infantile eczema the rash began in the colder months of the year, and in some could be definitely traced to exposure to cold winds, and it is significant that should a child commence with eczema during the autumn there is little prospect of recovery until the following summer.

METHOD OF DISTINGUISHING BETWEEN THE VARIOUS TYPES OF DERMATITIS

The only scientific approach to the treatment of a dermatitis is to try to classify it under the appropriate type. To this end a discriminate history is an essential prelude. The examiner should consider the possible influence of the patient's occupation or hobbies, the relation of previous skin affections, and the family history. Knowing the site of origin of the present attack will often give a clue to causation. An unsuitable application may change a traumatic dermatitis into a sensitisation dermatitis, and at the same time entirely alter the prognosis. The advantage of the patch test should be borne in mind. The search for the cause may take considerable time and ingenuity before it can be tracked down. Failure of coöperation owing to lack of intelligence in the patient is frequently disheartening, and it is necessary to make it quite clear to the patient that the skin eruption may be due to one of many causes. As a rule it is advisable to eliminate the possibility of the dermatitis arising from external contact before the question of the allergen coming from some internal cause is considered.

TREATMENT OF DERMATITIS

In view of the multiplicity of the causes, and the polymorphic character of the rash, it is obvious that every case is a special problem and must be treated according to the particular requirements; nevertheless the general principles—elimination of the cause, rest, and protection—are applicable to all.

Rest.—If the area of dermatitis is extensive, and particularly if the lower limbs are involved, effective rest plays a very important part in the recovery, and in my experience many an acute dermatitis is allowed to extend and affect large tracts of skin because rest in bed has not been insisted upon. The even temperature obtainable in bed, freedom from friction, and freedom from business worries, are of great assistance in controlling the tendency to spread. Furthermore, under these conditions the patient is likely to be removed from external source of contact which may have precipitated the onset of the rash. Protection is also effected by light coverings of gauze and bandages.

Diet.—Most patients' friends, if not the patient himself, expect great advantage from some modification of the diet, but in practice these anticipations are seldom realised, and no material benefit ensues unless the skin lesions are associated with some metabolic disorder such as nephritis or diabetes, or unless the patient has an idiosyncrasy to some particular food or is suffering from vitamin deficiency.

Internal remedies.—The administration of sedatives to rest the mind and promote sleep are an inherent part of the treatment when the dermatitis is at all extensive. Luminal, sodium bromide, and chloral hydrate are amongst the most useful drugs for this purpose.

Local applications.—Whatever the cause may be, itching and burning of the skin is the most consistent complaint of the patient who is suffering from dermatitis, and little progress is likely to be made until this is relieved. It is not sufficiently recognised that frequently changed wet dressings have an antipruritic value far superior to that of ointments masquerading under the name of "sedativum," even though the latter may contain cocaine and other analgesics. During the acute stage, when the inflammation is intense and accompanied by weeping, gauze soaked in lead lotion, or ½ per cent. silver nitrate lotion, should be changed hourly, and at night covered with waterproof material to prevent evaporation. When the weeping has abated the following lotion will be found to be a most valuable remedy: zinc oxide and kaolin, āā 1 oz.; glycerin, ½ oz.; water, to 12 oz. It has the advantage that it may be used with impunity, both for relieving the congestion and for cleansing purposes in all types of dermatitis; furthermore, it is inexpensive and therefore there are no reasons why it should not be used freely. Liq. plumbi subacet. may be added with advantage, and in the chronic stage the addition of ¼ to ½ per cent. crude coal tar or liq. picis carb. will stimulate recovery of the skin. Another well-tried and useful remedy is pasta zinci co. (Lassar's paste). It is suitable in the subacute stage of dermatitis, and the addition of a small percentage of tar may be tried tentatively when the inflammation has

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subsided. It is a good practice to try any new remedy on a limited portion of the eruption, in order to ascertain its suitability, and the intelligent use of a few well-tried remedies is preferable to the indiscriminate application of unknown but well-advertised preparations. Suitable doses of X rays applied in the subacute and chronic stage of dermatitis relieves irritation almost dramatically, and it is usual to find more improvement from their use than from any other remedy.

The treatment of infantile dermatitis in general principles differs little from that of the adult variety. Overclothing of the child, particularly at night, is a common error on the part of the mother, who should be made to understand that exposure to heat is almost invariably followed by intense irritation. Restraint from scratching must be enforced, and in no circumstances should soap and water be applied to the affected parts. Any necessary cleansing should be gently carried out by application of the zinc oxide and kaolin lotion referred to. It is an accepted fact that infants' skin is peculiarly tolerant to tar, and in view of its antipruritic qualities, may be commended as a suitable addition to either lotion or pasta zinci co.

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THE USE OF SULPHANILAMIDE IN THE TREATMENT OF MENINGOCOCCAL MENINGITIS

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SINCE sulphanilamide and its close allies* are now undergoing a clinical trial in the treatment of meningococcal meningitis, it has been suggested that further case reports should be made known. I am therefore describing six cases in which sulphanilamide has been used in this disease at St. Bartholomew's Hospital. The introduction of this use of the drug has been based on experimental work, notably by Buttle and others (1936) and Proom (1937), who demonstrated the protective effect of sulphanilamide on mice infected with meningococci. Branham and Rosenthal (1937) compared the results of drug therapy and serum therapy with ten strains of meningococci in mice. They found not only that the drug showed a marked therapeutic effect but that the combination of serum and drug therapy yielded much better results than either alone. It was then suggested that a combination of serum and drug therapy deserved a trial in man.

The following six cases therefore all received antiserum or antitoxin in addition to sulphanilamide. In none of them was any harmful effect produced by the sulphanilamide and all made good recoveries.

* I am indebted to Mr. G. Discombe for the following clarification of the various synonyms and trade-names of the groups of Prontosil drugs: (1) Prontosil flavum, Prontosil rubrum, or Red Prontosil (tablets). (2) Soluble Prontosil, Prontosil Solubile (5 per cent. solution). (3) Sulphanilamide, *p*-aminobenzenesulphonamide, Prontosil album, Streptocide, Sulphonamide-P (tablets). (4) Soluseptasine (5 per cent. solution). (5) Benzylsulphanilamide, benzyl-*p*-aminobenzenesulphonamide, Prosepta-sine (tablets). Inactive against meningococci.

CASE 1.—A man of '22, admitted on July 6th, 1937, with a history of 14 days' generalised papular rash and occipital headache. For four days he had had a sore-throat, and on admission he complained of headache and generalised pains. He rapidly became drowsy and photophobic in hospital and his temperature rose to 103·2° F. He vomited four times and showed extreme neck rigidity with pain on movement. Bilateral papilloedema was present; Kernig and Brudzinski signs were positive and abdominal reflexes absent.

Lumbar puncture revealed a turbid fluid (pressure over 300 mm.) containing over 100 mg. protein per 100 c.cm. and 1260 white cells (all polymorphs except an occasional lymphocyte). Large numbers of Gram-negative intracellular diplococci were seen and cultures produced a pure growth of meningococcus (Type I).

Treatment.—

July 6th: 2 P.M.: Intramuscular injection of 40 c.cm. of 2½ per cent. soluble prontosil.
3 P.M.: 55 c.cm. meningococcal antitoxin intravenously. Second drainage of spinal fluid (30 c.cm.).
8 P.M.: 50 c.cm. meningococcal antitoxin intravenously. Intramuscular injection of 20 c.cm. of 2½ per cent. soluble prontosil.
July 7th: 50 c.cm. meningococcal antitoxin intravenously. Intramuscular injection of 20 c.cm. 5 per cent. soluble prontosil.
July 8th: Sulphanilamide—1 gramme thrice daily by mouth—continued for 11 days.
Lumbar puncture was performed daily for a week and then less frequently.

Progress.—The patient remained very ill for the first two days, although his temperature fell to between 98° F. and 99·8° F. on the second day (July 7th). Herpes labialis developed and a post-nasal swab grew meningococci on culture. On July 9th his temperature was normal but he still complained of headache, and neck rigidity was still present. On the 12th he was able to sit up and read the paper. His headache was much better and clinical improvement was marked. On the 14th he developed a serum rash and in the course of the next few days the headache returned. Some dry lumbar punctures suggested that the return of headache was due to spinal block, and it was relieved by ventricular puncture, though for two weeks he was again feverish and headache was severe. On the 22nd he recommenced sulphanilamide (3·0 g. daily) for three days. By August 1st his temperature had settled to normal and he progressed well, although subject to occasional headaches. Papilloedema was absent and he slept well. He was discharged on August 24th and seen subsequently in good health.

Lumbar puncture findings were as follows:—

July 6th (2nd specimen): Very turbid; pressure 300 mm.; W.B.C. (white blood-cells) 35,400 per c.mm.; meningococci grown on culture.
July 8th: Slightly turbid; pressure 120 mm.; W.B.C. 3480 per c.mm.
July 9th: Opalescent; 80 mm.; 922 per c.mm.
July 10th: Clear; 485 per c.mm. (90 per cent. polymorphs).
July 15th: 1133 per c.mm.
July 16th: 2261 per c.mm.
July 19th: (Ventricular puncture). Opalescent fluid; polymorphs 980 per c.mm.; lymphocytes 70 per c.mm.; protein 90 mg. per 100 c.cm.; Gram stain, no organisms seen; culture sterile.
July 22nd: Clear fluid.

CASE 2.—A girl of 6 months. Admitted on Nov. 1st, 1937. For five days she had been off her food and vomiting. On the day before admission she was fretful and her neck became stiff. On admission her temperature was 102° F. and her pulse 160. She was ill and stuporose with neck rigidity, positive Kernig's sign, and tense fontanelle.

Lumbar puncture revealed a turbid fluid which with Gram's stain was seen to contain many intra- and extra-cellular Gram-negative diplococci. On culture a pure growth of meningococcus (Type II) was obtained.

Treatment.—

Antiserum:
Nov. 1st: 5 c.cm. polyvalent antimeningococcal serum intrathecally.
25 c.cm. polyvalent antimeningococcal serum intramuscularly.
Nov. 4th: 20 c.cm. Type II antiserum intramuscularly.
Nov. 5th: 20 c.cm. polyvalent antiserum intramuscularly.

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Sulphanilamide:
Nov. 2nd: gr. 2½ twice daily for 4 days.
Nov. 10th: gr. 2½ twice daily for 2 days.
Nov. 15th: gr. 2½ twice daily for 2 days.
Nov. 19th: gr. 7½ twice daily for 2 days.
Lumbar puncture was performed daily for 2 weeks (10 to 30 c.cm. being removed each time) and then less frequently.

Progress.—The temperature rose to 104·2° F. on the day following admission, but fell to 99·4° F. the next evening. Her general condition after one week was good, although she remained pyrexial for two weeks and suffered from some vomiting. On Nov. 8th she developed a profuse serum rash. One month later, on Dec. 8th, she was discharged well.

Lumbar punctures.—
Nov. 2nd: W.B.C. 224 per c.mm. (polymorphs and lymphocytes in almost equal proportions).
Nov. 3rd: W.B.C. 420 per c.mm.
Nov. 4th: Clear.
Nov. 6th: 4 lymphocytes per c.mm.
Nov. 9th: Fluid sterile on culture.

CASE 3.—A girl of 19. Admitted on Nov. 25th, 1937. For four days she had complained of a cold in the nose, fever, headache, giddiness, and vomiting. Her neck became stiff and her head retracted. Herpes labialis was present. Her temperature was 102° F.; Kernig's sign was positive; there was no photophobia.

Lumbar puncture revealed turbid fluid under greatly increased pressure, containing 42,400 W.B.C. per c.mm. (96 per cent. polymorphs). Gram stain showed Gram-negative diplococci and on culture a pure growth of meningococcus (Type I) was obtained.

Treatment.—
Antiserum:
Nov. 25th: 20 c.cm. polyvalent antimeningococcal serum intrathecally.
Nov. 26th: 30 c.cm. polyvalent antimeningococcal serum intrathecally (in 2 doses).
Nov. 27th: 20 c.cm. polyvalent antimeningococcal serum intrathecally.
10 c.cm. Type I antimeningococcal serum intrathecally.
Nov. 28th: 20 c.cm. Type I antimeningococcal serum intrathecally.
Antitoxin:
Nov. 27th: 30 c.cm. meningococcal antitoxin in 150 c.cm. N. saline intravenously.
Nov. 28th: 30 c.cm. Ditto.
Sulphanilamide, &c.:
Nov. 25th: 40 c.cm. soluseptasine in 150 c.cm. N. saline intravenously.
Nov. 25th: Sulphanilamide 1·0 g. 4 times daily by mouth.
Nov. 26th: Ditto 1·5 g. 4 times daily (for 5 days).
Dec. 1st: Ditto 1·0 g. 3 times daily (for 7 days).
Total dosage: 54·0 g. sulphanilamide, 2·0 g. soluseptasine.
Lumbar puncture daily for 11 days, then less regularly.

Progress.—On Nov. 26th, the day after admission, her headache was easier but her back was more arched and she was cyanosed. Methæmoglobin was present in considerable concentration in her blood and the spinal fluid was found to contain 5·2 mg. of sulphanilamide per 100 c.cm. On Nov. 28th she could move her head better, and on the 30th the back was less arched. On Dec. 2nd she could flex her head slightly. On the 3rd she developed a serum rash, followed by arthritis. The temperature did not settle until four weeks after admission. She was discharged well on Jan. 9th.

Lumbar punctures.—
Nov. 25th: W.B.C. 42,400 per c.mm. Meningococci seen by Gram's stain and on culture.
Nov. 29th: 7500 per c.mm. Gram stain—no meningococci seen.
Nov. 30th: 3100 per c.mm.
Dec. 1st: 1600 per c.mm.
Dec. 2nd: 800 per c.mm.
Dec. 7th: 40 per c.mm.
Dec. 20th: 20 per c.mm.
Jan. 5th: 18 per c.mm. (14 lymphocytes). Sterile on culture.

CASE 4.—A boy of 14. Admitted on Feb. 17th, 1938. For five days he had complained of malaise, headache, and general aching pains. For one day he had had an erythematous and papular rash on the limbs. On admission he had a severe headache, was photophobic, and looked ill. There was neck rigidity with positive Kernig and Brudzinski signs. His optic discs were blurred, abdominal reflexes absent, and there was a right-sided extensor plantar response. Temperature 103·8° F. Lumbar puncture revealed turbid fluid under pressure of over 300 mm., containing 190 mg. protein per 100 c.cm. and about 6000 W.B.C. (polymorphs) per c.mm. A few Gram-negative intracellular diplococci were seen, but no culture was made.

Treatment.—
Antitoxin:
Feb. 18th: 60 c.cm. meningococcal antitoxin + 140 c.cm. N. saline intravenously.
Feb. 19th: Ditto.
Feb. 20th: Ditto.
Sulphanilamide:
Feb. 18th: Sulphanilamide 2·0 g. thrice daily.
Feb. 19th: Sulphanilamide 1·0 g. 4 times daily till Feb. 22nd when he had 21·0 g. sulphanilamide and appeared cyanosed.
Feb. 24th: Sulphanilamide 1·0 g. thrice daily till Feb. 28th when he had had a further 13·0 g.
Lumbar puncture daily for 14 days.

Progress.—The temperature on the second day was 104·4° F. in the morning but fell to 100° F. in the evening and was within normal limits in a week, though it became irregular again until the end of the second week. After the first week there was no neck rigidity, though Kernig and Brudzinski signs were still slightly positive. He looked and felt very much better. On Feb. 25th he developed a serum rash with recurrence of pyrexia (up to 102·4° F.). On March 12th he got up on a couch and on the 24th he was discharged well.

Lumbar punctures.—

	W.B.C. (per c.mm.)	Pressure (mm.).		W.B.C (per c.mm.).	Pressure (mm.).
Feb. 17th	6000	Over 300	Feb. 24th	32	240
Gram-negative diplococci seen.			Feb. 25th	22	270
Feb. 19th	1200	60	Feb. 26th	18	260
Gram film—no organisms seen. Sterile on culture.			Feb. 27th	10	240
			Mar. 2nd	3	285
Feb. 20th	270	300	Mar. 4th	2	300
Feb. 23rd	80	300	Mar. 18th	4	210

CASE 5.—A boy of 4. Admitted on Feb. 25th, 1938. For two days he had been feverish and complained of headache and giddiness. On the day before admission he vomited. On admission his temperature was 102·2° F., and he was semi-comatose and photophobic. There was internal strabismus of the left eye, neck rigidity, and head retraction. Kernig and Brudzinski signs were positive and there was a right-sided extensor plantar response.

Lumbar puncture revealed purulent fluid which formed a large clot and small deposit of pus on standing. The protein content was 390 mg. per 100 c.cm. Gram-negative diplococci were seen (mainly extracellular) amongst the pus cells and a pure growth of meningococcus was obtained on culture.

Treatment.—
Antiserum:
Feb. 25th: 10 c.cm. antimeningococcal serum intrathecally.
Feb. 26th: Ditto.
Mar. 1st: Ditto.
Antitoxin:
Feb. 25th: 30 c.cm. meningococcal antitoxin intravenously.
Feb. 26th: Ditto.
Sulphanilamide, &c.:
Feb. 25th: Prontonsil rubrum 5 c.cm. intramuscularly.
Feb. 27th: Sulphanilamide gr. 15 thrice daily by mouth for 8 days (cyanosis).
Daily lumbar puncture for 8 days, then less often.

Progress.—On Feb. 26th, the day after admission, his general condition was much improved and he was asking and answering questions. In three days he seemed very well. On March 2nd he developed a serum rash and slight œdema of the larynx, for which he received adrenaline. On the 28th he was up and very cheerful with no residual paralysis. His spinal fluid was reported clear on March 3rd, when there were only 60 W.B.C. per c.mm. By the 19th these had decreased to 6 per c.mm. He was discharged well on May 4th with sterile cerebro-spinal fluid.

CASE 6.—A boy of 7 months. Admitted on March 2nd, 1938. Two days previously he had become feverish, fretful, and dyspnœic, and one day previously

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he had vomited and his temperature had been 104° F. On admission he appeared very ill, his temperature was 103° F., his pulse 168, and his respiration-rate 60. His alæ nasi were active and he cried if moved. His head was stiff but not retracted, and Kernig's sign was slightly positive. There were no definite abnormal findings in the chest, but a tentative diagnosis of pneumonia was made.

By March 5th, however, head retraction became very marked and a *lumbar puncture* revealed a turbid fluid, under pressure, containing 27,800 W.B.C. per c.mm. and Gram-negative diplococci. On culture meningococcus (Type I) was grown. A radiogram of the chest on March 7th showed increased clouding at the root of the left lung.

Treatment.—

Antiserum:
Mar. 5th: 6 c.cm. antimeningococcal serum intrathecally.
Mar. 6th: 10 c.cm. antimeningococcal serum intramuscularly (in 2 doses).

Sulphanilamide, &c.:
Mar. 5th: 3 c.cm. soluseptasine intramuscularly 4-hourly (5 times).
Mar. 6th: 5 c.cm. soluseptasine intramuscularly 4-hourly (7 times).
Mar. 7th: Sulphanilamide gr. 2 4 times daily by mouth for 6 days.
Mar. 13th: Sulphanilamide gr. 4 4 times daily by mouth for 3 days.
Mar. 8th: 8 c.cm. of 0·8 per cent. sulphanilamide in N. saline intrathecally for 8 days.
Lumbar puncture almost daily from Mar. 5th to 15th.

Progress.—Temperature remained high at first, but fell to 99° F. after a week. The child then developed vomiting and diarrhœa and the temperature ranged about 100° F. for ten days, after which the infection subsided. Opisthotonus had become very marked at the beginning of treatment, but by the third week there was very little neck rigidity and the child was quite happy. On March 8th the C.S.F. (cerebro-spinal fluid) contained only 240 W.B.C. per c.cm. and no diplococci were seen, though they were grown after 48 hours' culture. On the 14th the C.S.F. contained 14 cells (polymorphs) per c.mm., and on the 17th it contained 2 polymorphs per c.mm. and culture was sterile. The child was discharged well on April 11th.

DISCUSSION

Although this small group of cases can be of no statistical importance, the progress of each of the patients was striking. In all six instances meningococci were seen in films of the spinal fluid, and in all but one (in which no culture was made) the organism was grown on blood-agar. All six cases were treated with both specific therapy and drug therapy and made complete recoveries, the spinal fluid becoming sterile.

All the cases were particularly severe, and the general impression was gained that combined serum and drug treatment produced results beyond expectation. Unfortunately there was no uniformity in the method of treatment, since the patients were in different wards, and prontosil derivatives were given by mouth, intramuscularly, intravenously, and intrathecally, the usual dose by mouth being from 1 to 6 g. of sulphanilamide daily. Except for transient cyanosis there were apparently no untoward effects from the drug. All but one of the six cases, however, developed some form of serum sickness.

In two of the cases the sulphanilamide content of the C.S.F. was estimated. In Case 3 this was found to be 5·2 mg. per 100 c.cm. on the second day. In Case 6 it was found to be 2·5 mg. per 100 c.cm., while the patient was having gr. 2 four times daily, and 2·4 mg. per 100 c.cm. the day after this dose had been doubled.

Marshall and others (1937a and b) showed experimentally that sulphanilamide given by mouth rapidly enters the C.S.F., both in normal human subjects and those suffering from meningococcal meningitis; they suggested that, when possible, oral administration would appear to be indicated when its presence in the C.S.F. is desired. The concentration of sulphanilamide in the C.S.F. is very variable and Crawford and Fleming (1938) found that the concentration altered considerably with a constant dosage of sulphanilamide, but also that the amount found in the C.S.F. seemed to bear no relation to the course of the disease nor to the speed with which the fluid was sterilised. They suggest giving the drug intrathecally in cases in which the meningeal symptoms do not clear up rapidly, in cases in which the C.S.F. does not rapidly become sterile, and in cases which show intolerance to the drug by other routes.

Schwentker, Gelman, and Long (1937) treated 10 cases of meningococcal meningitis with intrathecal and subcutaneous sulphanilamide alone. In no case was the organism recovered from the C.S.F. longer than three days after beginning treatment, and the rate of clinical improvement varied from rapid to gradual, with only 1 death. Eldahl (1938) also treated the disease exclusively with sulphanilamide, given intrathecally and intramuscularly. His cases were all severe ones under the age of 4, and out of 12 cases so treated 9 recovered. He concluded that the intrathecal route alone was insufficient and was best combined with oral or intramuscular administration, which can affect the meningococci found outside the spinal canal.

Neal and Appelbaum (1938), on the other hand, dealing mainly with streptococcal and pneumococcal meningitis, state that they do not feel sure that there is any advantage in administering the drug intrathecally, for most of their recovered cases were not treated in this manner. Crawford and Fleming (1938), in their comprehensive paper, describe the recovery of 9 out of 10 children (4 of them under 1 year of age) from meningococcal meningitis by the use of intramuscular and oral sulphanilamide. In the first 2 cases intrathecal antiserum was also used and in the last 4 cases intrathecal sulphanilamide in addition to the oral and intramuscular administration was employed.

No decision as to the best method of administering the drug can yet be arrived at, though it would appear that full dosage by mouth at the earliest opportunity is not only simple but may be the most effective procedure. Whether sulphanilamide given alone is as effective as in combination with antiserum and antitoxin, whether sulphanilamide is ever to be given intrathecally, and whether the variable concentration of the sulphanilamide in the spinal fluid is of any great significance, are questions which at present must remain open.

I wish to express my indebtedness in particular to Dr. Geoffrey Evans and also to Dr. F. G. Chandler, Dr. George Graham, Dr. Charles Harris, and Prof. L. J. Witts, who have given me permission to report cases under their care.

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SURGICAL TREATMENT OF PITUITARY BASOPHILISM

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Cushing's syndrome of pituitary basophilism is now a sufficiently well-recognised clinical entity that for the purposes of this paper it does not require detailed description.

Cushing (1932a and b) reported 14 cases of a syndrome of plethoric obesity, loss of sexual activity, hirsutism, cutaneous striation, polycythæmia, vascular hypertension, hyperglycæmia, and osseous decalcification. The association of this syndrome with basophil adenomas of the pituitary body promised for a time to be a distinct clinical entity, but soon there appeared reports of a syndrome that may be clinically indistinguishable from Cushing's, which arose in association with tumours of the adrenal cortex (Lescher and Robb-Smith 1934, Kepler 1933, Hare 1935, Calder and Porro 1935, Oppenheimer, Globus, Silver, and Shaskin 1935). Moreover, Leyton (1934) reported two cases in which many of the features of Cushing's syndrome were associated with malignant tumours of the thymus.

Crooke (1935), on examining the pituitaries from 12 cases of Cushing's syndrome, 6 of which showed a basophil adenoma, 3 an adrenal tumour, and 3 a thymoma, found a striking change in the cytoplasm of the ripe basophil cells of the pituitary. This change consists of the replacement of the normal granular appearance of the cytoplasm by a dense homogeneous hyaline material which is highly refractive and which has characteristic staining reactions. In the presence of a basophil adenoma the change was observed not in the cells of the tumour itself but in the remaining basophil cells of the pituitary. In certain cases of basophil adenoma, which were chance findings and were unassociated with Cushing's syndrome, the hyaline change was not observed. Crooke concludes that the change is an expression of altered physiological activity, which is the alteration of fundamental significance in Cushing's syndrome.

TREATMENT

In view of the observation that in certain cases of Cushing's syndrome a cure has followed the removal of a cortical adrenal tumour (Kepler and others 1934), it seems that the exclusion of the possibility of such a tumour is an essential preliminary to treatment. Radiological evidence of an adrenal tumour should first be sought; this may be revealed by the presence of calcification, or by the downward displacement of one kidney as shown by pyelography, or by radiography after the injection of air into the perirenal tissues. Even in the absence of any such evidence of an adrenal tumour Kepler (1934) recommends exploratory laparotomy as a routine procedure, and there is much to be said in favour of this, since the overlooking of an adrenal tumour and the concentration of attention on the pituitary would be calamitous.

If an adrenal tumour is found and removed, it is of the utmost importance that cortical extract and saline should be in readiness for intravenous injection, because adrenal insufficiency may follow the removal of a functionally active tumour in the same way as severe tetany may follow the removal of a parathyroid adenoma. The treatment of an "oat-cell" carcinoma of the thymus, such as was present in Leyton's two cases, does not seem to come within the scope of practical therapy, even were such a tumour recognised before death.

If the presence of an adrenal or thymic tumour be excluded we consider it justifiable to attempt to influence the activity of the pituitary. Deep radiotherapy directed at the pituitary region has in a few cases produced striking results, notably in the cases of Lawrence (1933) and Jamin (1934). Cushing also obtained obvious improvement in one of his cases with radiotherapy, but three years later there was a return of symptoms, and a rapid rise of blood pressure terminated in the occurrence of a pontine hæmorrhage. A basophil adenoma of the pituitary was found at autopsy (Kessel 1936).

If radiotherapy should fail to produce any improvement, and if the life of the patient appears to be threatened by persistent hypertension or osseous decalcification, the question of a surgical attack upon the pituitary may then be considered. Assuming that there is a state of hyperpituitarism in Cushing's syndrome, and that Crooke's hyaline change is a manifestation of this hyperpituitarism, we consider it reasonable to attempt to reduce the secretory activity of the anterior pituitary, when deep radiation therapy has failed, by the implantation of radon seeds into the pituitary, and we have done this in the following two cases.

FIRST CASE

A woman aged 26 was first seen on Nov. 4th, 1933, when she complained of headache, shortness of breath, adiposity, and high colour.

These symptoms were all of three years' duration. The obesity developed rapidly and affected chiefly the abdomen. Menstruation began at the age of 16, but was never regular; she might go as long as five months without a period. There had been complete amenorrhœa for three years. She complained of nocturnal frequency of micturition and a continuous aching pain in the left side. During the previous year a growth of hair had appeared on the lips and chin. She had been fair until the age of 4 when, following scarlet fever, her hair became dark. The previous health and family history were unremarkable.

Examination.—Weight 11 st. 5 oz. Very high colour of face (Fig. 1 A). Trunk very obese, especially about abdomen (Fig. 2 A). Legs and arms did not share in the obesity. Purple striæ atrophicæ present on abdomen. Hair of head dark, somewhat scanty, and brittle. Scanty growth of hair on chin and lips, and fine dark hair on arms and legs. The pubic hair reached the umbilicus. The legs showed a blotchy cyanosis. Lungs: no abnormal signs but a troublesome cough. Blood pressure: 175/110 mm. Hg. Accentuation of aortic second sound. Spine: slight general kyphosis. Central nervous system normal. Visual fields normal. Fundi normal.

Special investigations.—Blood: Wassermann reaction negative; urea, 30 mg. per 100 c.cm. serum; calcium, 10·2 mg. per 100 c.cm. serum; phosphorus, 2·88 mg. per 100 c.cm. plasma; red cells, 6,160,000; hæmoglobin, 118 per cent.; white cells, 15,000 (polymorphs 73 per cent., lymphocytes 17 per cent., monocytes 9 per cent., eosinophils 1 per cent.). Aschheim-Zondek reaction negative. Electrocardiogram: sinus rhythm, left axis-deviation. Radiography: sella turcica of normal outline; vertebræ subnormal in density and trabeculæ of femora coarse; heart generally enlarged. Excretion urogram: both right and left renal pelves within normal limits, and kidneys undisplaced.

Preliminary treatment.—The patient received three courses of deep radiotherapy directed to the pituitary fossa, the only effects of which were a slight reduction of the hæmoglobin percentage and three menstrual losses. The weight was unaffected and the blood pressure continued to rise (see Table I). It was resolved that some further attempt should be

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made to control the disease, and it was decided that a direct attack upon the pituitary should be carried out.

TABLE I—PROGRESS OF CASE 1

Date.	Weight.	Blood pressure (mm. Hg).	Menses* (days).	Red cells (millions per c.mm.).	Hæmoglobin (%).
1933.	st. lb.				
Nov. 4th	11 0	175/110	Nil for 3 yrs.	6·16	118
RADIOTHERAPY					
Dec. 14th	10 12	190/110	0	4·96	100
1934.					
Jan. 12th	11 1	150/100	0	..	..
Feb. 6th	11 4	190/120	+	..	..
March 2nd	11 2	175/110	0	5·35	106
RADIOTHERAPY					
March 22nd	10 12	170/110	0	5·01	100
April 24th	11 2	185/110	+	..	..
May 22nd	11 3	160/110	+	..	..
June 19th	12 0	185/110	0	..	..
RADIOTHERAPY					
July 18th	11 12	190/110	0	5·52	80
Sept. 11th	11 3	180/100	0	4·67	80
OPERATION (NOV. 21ST): INSERTION OF RADON					
1935.					
Jan. 3rd	11 10	150/95	6	4·53	65
Feb. 14th	11 6	150/90	0	5·37	68
April 25th	11 1	145/95	0	5·15	65
Aug.	..	..	6	..	..
July	..	..	6	..	..
Sept. 30th	..	135/90	6	5·24	65
Oct. 28th	11 10	150/110	6	..	..
Dec. 2nd	..	145/90	6	..	..
1936.					
Jan. 6th	..	145/100	4	..	..
Feb. 3rd	11 6½	150/105	5	..	..
March 6th	..	160/100	0	..	..
April 30th	..	..	7	..	..
May 26th	..	145/90	4	..	..
Sept. 14th	11 2	150/100	0 for 4 mths.	5·00	67
Nov. 9th	11 5	140/100	6	..	..
1937.					
Jan. 4th	..	135/100	0	4·86	65
Nov. 18th	11 4	140/100	0	4·85	63

* Menstrual period and duration reported on attendance.

Operation.—On Nov. 21st, 1933, under endotracheal nitrous oxide and oxygen anæsthesia, a right transfrontal exploration was made. In spite of the elevated blood pressure there was very little bleeding apart from that resulting from an increase in vascularity of the bone. The rarefaction of the bone was shown by its softness and a tendency to crumble when bitten by the skull forceps. The region of the sellar diaphragm was exposed without difficulty and two small longitudinal incisions were made in the diaphragm with a right-angled knife. The diaphragm had a brown colour but there was no gross evidence of a pituitary tumour. Through the incisions two radon seeds were inserted into the sella, each of 2 millicuries dosage with gold screenage (Fig. 3). The operation was without incident and the patient made an uncomplicated post-operative recovery.

Progress.—Since the operation the patient's condition has shown an obvious improvement. The weight has shown little alteration, but the blood pressure maintains a generally lower level than before the operation and the menses are much more frequent. The hæmoglobin percentage has fallen to about 65 per cent., at which level it would appear to have settled. It is noteworthy that when the hair grew again after the operation, for which the whole head had been shaved, it grew a medium brown colour, having previously been dull black, and is glossy and of better quality (Fig. 1 B). The growth of facial hair has ceased. The face has lost its previous bloated appearance and, were it not for the persistence of the abdominal obesity, the patient would pass for normal. No new striæ have appeared and acrocyanosis has gone (Fig. 2 B). The blood-sugar curve had returned to normal before operation and has remained so (Fig. 4).

A B

FIG. 1 (Case 1).—(A) Before any treatment (Nov. 11th, 1933). (B) 26 months after insertion of radon in pituitary (Feb. 4th, 1937). Note change in colour of hair.

Summary.—A woman aged 26 showed abdominal obesity, hirsutism, cutaneous striation, amenorrhœa, vascular hypertension, hyperglycæmia, polycythæmia, and slight skeletal decalcification. There was no evidence of an adrenal or thymic tumour. Slight improvement followed three courses of radiotherapy to the pituitary, but the insertion of radon into the pituitary fossa had a greater and more sustained effect, shown by a lowering of the blood pressure and hæmoglobin percentage and a return of menstruation.

TABLE II—PROGRESS OF CASE 2

Date.	Weight.	Blood pressure (mm. Hg).	Menses.	Red cells (millions per c.mm.).	Hæmoglobin (%).
1934.	st. lb.				
June 25th	9 2	..	0	..	..
July 12th	8 10	120/100	0	5·39	103
RADIOTHERAPY					
Sept. 4th	8 5	130/95	0	..	..
RADIOTHERAPY					
Nov. 14th	8 4	170/120	0	..	..
Dec. 12th	8 3½	160/125	0	..	..
1935.					
Jan. 10th	8 2	130/100	0	6·14	103
RADIOTHERAPY					
Feb. 7th	8 2	130/110	0	..	..
April 23rd	8 4	140/110	0	..	..
May 21st	..	170/110	0	..	..
July 1st	8 13	150/105	0	..	..
Oct. 3rd	..	150/110	0	4·88	90
OPERATION (OCT. 7TH): EXPLORATION OF ADRENALS. (OCT. 24TH): EXPLORATION OF PITUITARY FOSSA					
Dec. 5th	..	145/120	0	4·61	85
OPERATION (MAY 25TH): INSERTION OF RADON					
1936.					
June 4th	..	145/115	0	..	..
Sept. 29th	..	145/120	0	5·91	75
1937.					
Jan. 11th	8 12	145/90	0	5·58	60
Feb. 4th	8 13	130/95	0	4·50	60
Nov. 18th	8 7	140/90	0	5·61	78

SECOND CASE

A girl aged 16 was first seen on June 22nd, 1934. She had enjoyed good health until 8 months previously, when menstruation, which had hitherto been regular, ceased completely.

At about the same time she noticed purple streaks on the calves of her legs which spread rapidly on to the thighs, flanks, shoulders, and breasts. She put on weight rapidly and a "roll of fat" appeared about her middle. Her face became round so that her friends failed to recognise her. Dark fine hair

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appeared on the arms, chest, and back, and also slightly on the face. The hair of the head became darker and tended to fall out. The colour of the face became livid and her arms and legs often went blue. She made no other complaint at this time. The family history was irrelevant.

Examination.—She was a cheerful intelligent girl, 5 ft. in height and weighing 9 st. 2 lb. The face was round and bloated, the colour was high but not strikingly so (Fig. 5 A). The neck was thick and the thyroid gland was moderately enlarged. The breasts were large and pendulous, and there was a pad of fat over the lower cervical spinous processes. There was obesity of the abdomen but the limbs were normally proportioned (Fig. 6 A). Large purple striæ were present in the skin over the calves, thighs, flanks, breasts, and shoulders. The hair of the head was fine and black, and hair was growing over the rami of the mandible and on the arms and back. The pubic hair was normal in distribution. No abnormal physical signs were detected on the heart, lungs, abdomen, or central nervous system. The blood pressure was 120/100.

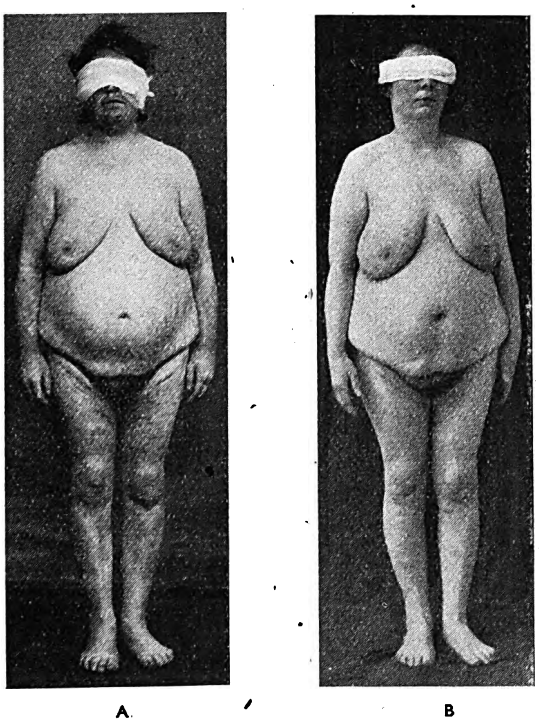

FIG. 2 (Case 1).—(A and B as Fig. 1.) Note absence of acrocyanosis and of new striæ after treatment.

Special investigations.—Blood: urea, 30 mg. per 100 c.cm. serum; calcium, 10·6 mg. per 100 c.cm. serum; phosphorus, 2·66 mg. per 100 c.cm. plasma; red cells, 5,393,000; hæmoglobin, 103 per cent.; white cells, 8750 (polymorphs 79 per cent., lymphocytes 15 per cent., monocytes 5 per cent., eosinophils 1 per cent.). For sugar see Fig. 7. Radiography: sella turcica very small; the lumbar vertebral bodies showed decalcification.

Urine for gonadotropic hormone.—No œstrin in detectable amounts—i.e., below 15 units. No gonadotropic hormone of pregnancy type. Considerable quantities (more than 20 units) of œstrogenic gonadotropic hormone. This finding is not unlike the findings in menopausal and oöphorectomy cases (Pregnancy-diagnosis Station, Edinburgh).

FIG. 3 (Case 1).—Radiogram of normal-sized pituitary fossa showing position of radon seeds (natural size).

CLINICAL COURSE

Treatment and progress.—Three courses, each of 13 exposures, of deep radiotherapy were given to the pituitary region in July and October, 1934, and in January, 1935. No real improvement resulted and the blood pressure rose steadily, reaching a level of 170/120 mm. Hg on Nov. 14th, 1934 (see Table II). In March, 1935, she complained of pain in the thighs which made walking difficult, but nothing abnormal was found. In July, 1935, she complained of great muscular weakness, but the pain had gone. At that time new striæ had appeared on the arms. In view of the progressive deterioration in the patient's condition and the failure of deep radiotherapy, it was decided to make a direct attack on the pituitary after an adrenal tumour had been excluded. On Oct. 7th, 1935, an exploratory laparotomy was performed by Mr. Andrew Logan. Both adrenals were palpated through a midline abdominal incision and no enlargement or tumour could be detected.

Operation.—Under endotracheal nitrous oxide and oxygen anæsthesia, a right transfrontal exposure of the pituitary region was made on Oct. 24th, 1935. The bone of the skull showed the same appearances as that in the first patient. The sellar diaphragm appeared to be a little full and showed a distinct brown coloration. Although a supply of radon was at hand the exposure of the sellar diaphragm was so clear that it was decided to make an attempt to remove part of the anterior lobe of the pituitary, in view of the frequency with which basophil adenomas arise in the extreme anterior and superficial parts of the anterior lobe. Accordingly a T-shaped incision was made in the diaphragm, the transverse limb lying 1 mm. anterior to the plane of the hypophyseal stalk and the vertical limb extending forwards from it. Through this incision the exposed part of the pituitary was removed with a sharp spoon. As soon as the spoon was inserted into the pituitary a small

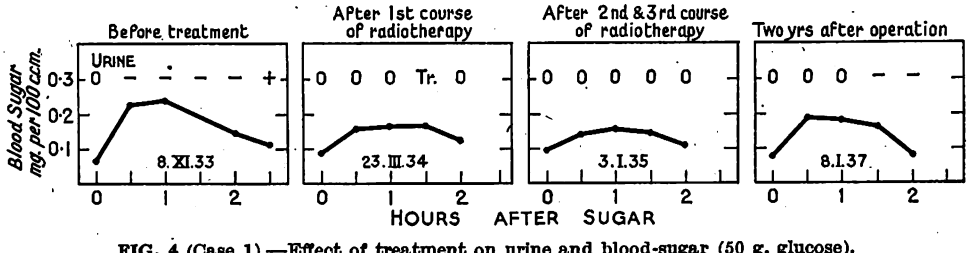

FIG. 4 (Case 1).—Effect of treatment on urine and blood-sugar (50 g. glucose).

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A B

FIG. 5 (Case 2).—(A) Before any treatment (June 28th, 1934). (B) 8½ months after insertion of radon (Feb. 4th, 1937).

quantity of a pultaceous material was seen to be extruded from the anterior lobe. This might well have been the central part of a loose-textured basophil adenoma, but unfortunately the presence of bleeding precluded the obtaining of any of this tissue for histological examination. After all bleeding had been controlled the operation was concluded.

Pathology.—Examination of the fragments of the anterior lobe which had been removed showed no evidence of a basophil adenoma. Had such an adenoma been present it is reasonable to suppose that the tissue had been unavoidably lost during the operation. The parts of the anterior lobe showed an increase in eosinophil cells with the presence of cytoplasmic hyalinisation in the basophil cells.

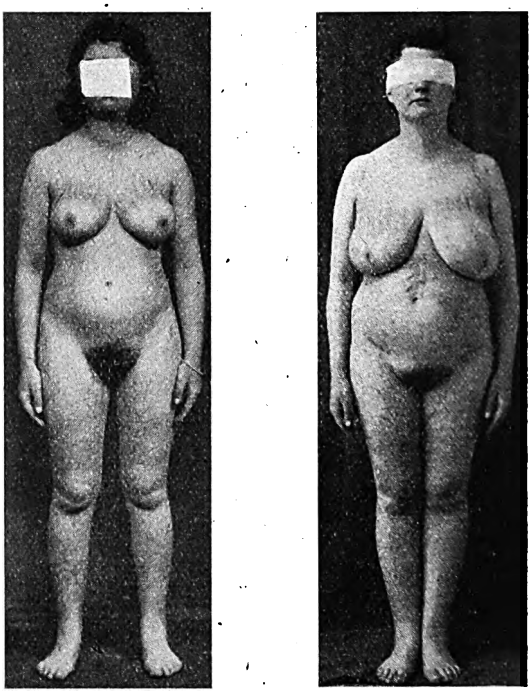
Further progress.—The operation was well withstood and convalescence was uneventful. There was no polyuria. The blood pressure fell to subnormal levels during the first week after operation, but had risen to 145/120 mm. Hg on Dec. 5th, 1935. Her condition remained practically unchanged until 5½ months after operation. At this time, while standing, she was seized by intense pain in the lumbar region of the spine and was obliged to remain in bed.

Readmission.—She was readmitted to hospital on April 17th, 1936, complaining of very severe pain in the lumbar region which was made worse by movement. There was a general kyphosis of the lumbar spine with tenderness on pressure over the upper three lumbar spinous processes. Radiographic examination of the spinal column showed pronounced decalcification of all vertebral bodies with a biconcave appearance and shortening of the bodies of the 11th and 12th thoracic and 1st lumbar vertebræ. It was evident that the disease process was still active, and in view of the absence of evidence of an adrenal or thymic tumour it seemed safe to suppose that the pituitary was still at fault.

Insertion of radon.—On May 25th the pituitary region was again exposed and three radon seeds were inserted into the sella. A total dosage of 9 millicuries with platinum screenage was employed and the seeds were left permanently in situ as in the first case.

Progress.—As soon as the patient had recovered consciousness she said that her backache had gone and she has remained free of it since. There was a post-operative polyuria which lasted for ten days, but recovery was otherwise uneventful. Since her discharge from hospital the patient has been in a perfect state of subjective health and can walk for long distances without backache. The weight, blood pressure, and blood examination figures will be seen in Table II, and the changes in the blood-sugar curve in Fig 7. There has been little change in the configuration of the body but the face has lost its bloated appearance (Figs. 5B and 6B). There is as yet no radiological evidence of recalcification of the vertebral bodies.

Summary.—A girl aged 16 when first seen showed abdominal obesity, hirsutism, cutaneous striation, amenorrhœa, hypertension, slight hyperglycæmia and polycythæmia, and gross skeletal decalcification. The adrenals were not enlarged. Radiotherapy and the removal of part of the anterior lobe of the pituitary would appear to have had no influence on the course of the disease, but improvement has followed more intense radiation treatment by the insertion of radon into the pituitary.



A B

FIG. 6 (Case 2).—As Fig. 5.

DISCUSSION

Although in the first case no histological confirmation of the pathology is available, no pituitary tissue having been removed, there is no reason to doubt, on clinical grounds, that the case was a typical one of Cushing's syndrome. At the time when the

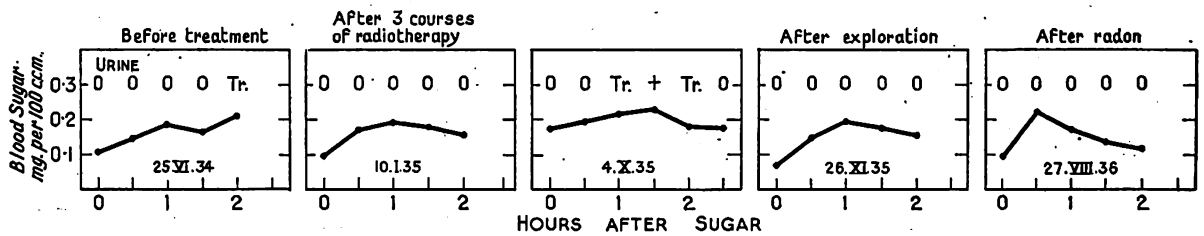


FIG. 7 (Case 2).—Effect of treatment on urine and blood-sugar (50 g. glucose).

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operation was undertaken (November, 1933) the importance of adrenal tumours in producing many of the features of the syndrome was not fully appreciated, though in this case every care had been taken to exclude the possibility of an adrenal tumour short of an exploratory laparotomy.

In the second case the possibility of an adrenal tumour had been excluded by means of an exploratory laparotomy and histological verification of Cushing's syndrome had been obtained by the demonstration of the Crooke hyaline change. Whether or not a basophil adenoma was removed in this case is not known, but had such an adenoma been present in the pars anterior of the pituitary, its removal does not appear to have influenced the course of the disease. The relief from bone pain that followed immediately after the implantation of radon in this case seems to be analogous to that which may follow immediately the removal of a parathyroid tumour in generalised osteitis fibrosa. The blood-sugar curve shows a closer approximation to normal after operation than in the case of the first patient, but the reduction of blood pressure and the hæmoglobin percentage are approximately the same in both cases.

On whatever basis the results in these two cases are assessed it is evident that the implantation has not provided a "cure" for the syndrome. On the other hand considerable improvement has followed the operation and the menace of a progressively increasing blood pressure no longer exists. Moreover, in the second case the disablement resulting from osseous decalcification has disappeared after the radon implantation. The results following the use of 9 millicuries of radon in the second case are not strikingly different to those following a dosage of 4 millicuries in the first case, but the seeds in the first case were more favourably placed for influencing the activity of the pituitary, owing to the shape of the sella turcica.

Although both patients are in a state of excellent subjective health their external configuration has been little altered. The general appearances are however much improved as a result of the disappearance of the plethora and the growth of hair on the face.

In view of the doubtful part played by the basophil adenoma in Cushing's syndrome, it is our opinion that treatment that aims at removing such a tumour is not rational Our own experiences appear to lend support to Crooke's views that the hyaline change is one of fundamental significance on the production of the syndrome.

SUMMARY

Two cases of Cushing's syndrome in young women are described in which improvement followed the insertion of radon seeds into the sella turcica. Both cases had proved resistant to deep radiotherapy and in view of a progressive increase in blood pressure, and the presence of gross osseous decalcification in the second case, operation was considered to be justifiable.

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ACTIVE IMMUNISATION AGAINST EPIDEMIC INFLUENZA

BY MEANS OF ELEMENTARY-BODY SUSPENSIONS HEATED AT 57° C.

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IN the search for an influenza prophylactic various preparations of virus have been investigated with encouraging results. In America living virus has been tried; Stokes and his co-workers (1937) first used filtrates of the lungs of infected mice and later virus grown on chick-embryo tissue cultures, while Francis and Magill (1937) inoculated virus repeatedly passaged through tissue-culture media. Antibody formation was stimulated and no serious reactions were observed. An opportunity of demonstrating with certainty increased resistance to spontaneous infection was only occasionally available. Stokes et al., however, found during the 1937 epidemic that the incidence of infection among the vaccinated group was substantially reduced as compared with the unvaccinated controls.

Burnet (1938) has applied intranasally the living virus modified by repeated passage on the chorio-allantoic membrane of the chick embryo. Experiments previously carried out on mice (1937) showed that immunity could be induced by intranasal inoculation of the modified virus. Such immunity appeared to be due to the production of a subclinical or a mild form of infection, for small lung lesions were found in many animals killed and examined a short time after immunisation.

Although introduction of the living virus into the human tissues has not yet given rise to any ill effects, its use appears potentially hazardous. Shope (1936), during field investigations on swine-influenza, considered that several outbreaks in swine under observation arose directly from living virus given intramuscularly during active immunisation experiments.

Killed virus is therefore more suitable for human inoculation, provided it is immunogenic. Andrewes and Smith (1937) found that the suspensions of virus, first washed and then inactivated by treatment with formalin, caused an increase in the antibody titre of the serum on subcutaneous injection into human volunteers. As influenza has not since appeared among the group under observation, they have been unable to determine whether the antibody increase is related to increased resistance to infection.

Fairbrother and Hoyle (1937a) showed that "elementary-body suspensions" (E.B.S.) inactivated by heat at 57° C. had an immunogenic activity in mice comparable with that of the living virus suspension. They also found that 0·5 per cent. phenol was an excellent preservative. The activity of heated E.B.S. has now been examined in more detail.

TECHNIQUE

The various technical procedures have been fully described in earlier papers (Fairbrother and Hoyle 1937b; Hoyle and Fairbrother 1937), and only the general points need now be given.

Preparation of elementary-body suspensions.—Lungs of infected mice were ground up in saline and centrifuged at low speed for 20–30 minutes and the

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supernatant fluid collected. This was centrifuged at high speed (approx. 13,000 r.p.m.) for one hour, the supernatant fluid being discarded and the deposit emulsified in saline. This suspension was spun at low speed for 5–10 minutes and the supernatant fluid again centrifuged at high speed for one hour. The deposit was then emulsified in saline to bring it to about the original volume and this constituted the E.B.S.; it was later found that a further spinning on the low-speed centrifuge for 5–10 minutes was useful in removing extraneous material.

Neutralisation tests were carried out on mice under ether anæsthesia; virus suspensions after centrifuging at low speed were used and the usual dose contained approximately 10,000 minimal infecting doses. For this test it is essential that the mice should be healthy; the use of weak, unhealthy animals gives rise to irregular results owing to secondary infection.

In the *complement-fixation tests* the antigen was a standardised suspension of dried infected mouse lung; serum dilutions were examined using 2½ M.H.D. (minimal hæmolytic dose) of complement.

PROPERTIES OF THE VIRUS

Action of heat.—Fairbrother and Hoyle (1937a) have shown that heat at 50° C. acting for 30 minutes killed much, but not all, of the virus, while heat at 57° C. resulted in its complete inactivation. There was no alteration in the physical character of the suspension such as is obtained by heating the crude virus suspension. These observations have been confirmed in this work.

Elementary-body suspensions prepared on various occasions have been heated in a water-bath at 57° C. for 30–45 minutes, usually in amounts of 5–8 c.cm. and contained in test-tubes. These have been tested in mice for infectivity along with the original virus suspension (Table I). The virus was almost always

TABLE I—INFECTIVITY TESTS

Inoculum.	Result.				
	D	++	+	+−	0
E.B.S. 57° C.	0	0	0	3	61
Original suspension ..	16	17	12	5	3

E.B.S. = elementary-body suspension; D = death in 2, 3, or 4 days; ++ = lesions in both lungs; + = lesions in one lung; +− = small lesion in one lung; 0 = nil.

destroyed; in only 3 out of 64 instances were lesions produced, and each of these was small and confined to the hilum of one lung. In 1 case living virus was obtained from the lesion by passage through mice but in the other 2 cases attempts to demonstrate virus were unsuccessful. These results indicate that, under the conditions of the test, 57° C. was approximately the thermal death-point of the virus.

Suspensions were also heated at 85°–90° C. for 30 minutes; the virus was killed and while the physical appearance was unchanged, the immunising action was considerably reduced.

Action of phenol.—Phenol in a concentration of 0·5 per cent. has no appreciable effect on the virus and has been used as a preservative. Crude virus suspensions, to which 0·5 per cent. phenol has been added, have been kept for 5–6 weeks at 0° C. without any appreciable loss in infectivity for mice.

IMMUNISING ACTIVITY OF HEATED ELEMENTARY-BODY SUSPENSIONS

(*a*) *Mice.*—E.B.S. were heated at 57° C. for 30–45 minutes, phenolised (0·5 per cent.), and kept at 0° C. In almost every instance comparative tests were carried out with the heated E.B.S. and a sample of the virus suspension, from which the elementary bodies had been obtained, also phenolised (0·5 per cent.) and kept at 0° C.

Groups of 6–12 mice were selected and given two doses of 0·2 c.cm. at 7-day intervals, the first subcutaneously and the second intraperitoneally. The test dose of virus, varying in different experiments from approximately 2–10,000 minimal infecting doses, was given, 7 days after the second dose, by intranasal instillation under ether anæsthesia to the test animals and also to a group of uninoculated controls. All survivors were killed on the 4th or 5th day and examined for the presence of lung lesions.

The results of the various tests, some nine in all, have been similar and are combined in Table II.

TABLE II—IMMUNISATION OF MICE

Immunisation with—	Result.				
	D	++	+	+−	0
Live phenolised virus ..	1	3	7	12	24
E.B.S. 57° C.	4	5	8	15	16
Controls	24	17	16	6	2

A considerable degree of protection was obtained with both forms of vaccine. This was usually greater with the live virus suspension than with the heated E.B.S. The probable explanation is that the E.B.S. contained less virus than the crude suspension. In the preparation of an E.B.S. some virus is lost at different stages, and when the final volume is restored the concentration of virus is naturally decreased. It is probably most satisfactory to make up to only a half of the original volume, but in view of the small amount of material available for each test, the full volume of saline was usually added. The two readings are therefore not strictly comparable.

An attempt was made to confer protection by the intranasal administration of the heated E.B.S. but without any success. Two instillations were given under ether anæsthesia at an interval of 7 days; when the test virus was given after a further interval of 7 days extensive lesions were produced in all animals.

The protective value of the crude suspension heated at 57° C. was also examined. The results were similar to those recorded in an earlier paper (Fairbrother and Hoyle 1937a); protection was irregular and never great. There was also a definite change in the physical appearance of the suspension after heating.

The results indicate that elementary-body suspensions killed by heat at 57° C. are satisfactory immunising agents in mice.

(*b*) *Ferrets.*—It has been recorded by several workers that the artificial immunisation of normal ferrets does not induce sufficient protection to prevent infection following intranasal instillation of a potent virus. Nevertheless it is possible to reinforce the waning immunity of ferrets recovered from an attack some months previously and protect against subsequent infection.

A number of ferrets infected some 5–6 months previously had been kept in order to test whether their waning immunity could be reinforced by either the live phenolised virus suspension or the E.B.S. inactivated at 57° C.

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The ferrets were arranged in three groups: one received the live virus, another inactivated E.B.S., and the third kept as controls. Two doses of the vaccines were given at 7-day intervals; the first was 0·5 c.cm. given subcutaneously and the second 0·7 c.cm. intraperitoneally. Seven days later 1 c.cm.

TABLE III—REINFORCEMENT OF WANING IMMUNITY OF FERRETS INFECTED 5–6 MONTHS PREVIOUSLY

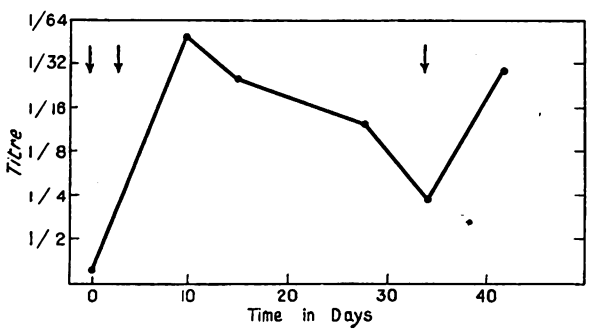
—	Immunisation with—	Result.
1	E.B.S. 57° C.	0 ; 0 ; 0.
2	Live phenolised virus.	0 ; 0 ; 0.
3	Convalescent controls.	++ ; ++ ; + ; 0 ; 0.
4	Normal controls.	++ ; ++ ; ++.

Each symbol represents an animal. 0 = no sign of infection; + = definite infection but no lung lesion; ++ = definite infection with marked lung lesions.

of a potent virus suspension was introduced intranasally under ether anæsthesia into each animal, together with those of a fourth group of normal controls. The animals were closely examined, temperatures taken twice daily, and each was finally killed to determine whether lung lesions had developed. The results are given in Table III.

While this experiment was not absolutely conclusive, the results suggest that both types of vaccine gave protection. Unfortunately the immunity of the convalescent animals had not decreased sufficiently at the end of 5–6 months to render all the controls susceptible to reinfection. However, 3 out of the 5 convalescent controls developed infection, in 2 cases with definite lung lesions, whereas all the immunised ferrets remained unaffected by the test virus.

(*c*) *Rabbit.*—The rabbit is naturally resistant to infection with the influenza virus but it is a useful animal for determining the antigenic activity of



Antibody production in the rabbit following intravenous inoculations of heated E.B.S. (shown by arrows).

virus suspensions, as the natural resistance to infection with the virus is not associated with the presence of antibodies in the serum.

A normal rabbit was bled and then given 0·4 c.cm. of a heated elementary-body suspension intravenously; 3 days later a further intravenous injection of 0·85 c.cm. of the same suspension was made. At various intervals subsequently sample-bleedings were taken and after 36 days 0·6 c.cm. of a fresh heated E.B.S. was injected; 7 days later the animal was again bled. Quantitative neutralisation tests were carried out on the various samples; these were done individually shortly after collection and also together at the end of the experiment in order that the various readings should be strictly comparable (see Figure). Complement-fixation tests were unsatisfactory as the mouse antigen and normal rabbit serum fixed complement.

The inoculation of the heated E.B.S. gave rise to an appreciable antibody formation. There was a sharp rise in titre following the initial doses but this was not long maintained and after some 4 weeks it had declined considerably. Further immunisation again stimulated antibody production. This early decline in antibody titre was not unexpected, as Fairbrother and Martin (1938) have found that the sharp rise in antibodies following human infection is not maintained for any length of time. After 10–12 months the titres tend to return to the level given by normal individuals. The response of the rabbit was, however, further evidence that there was no impairment of the antigenicity of elementary bodies after heating at 57° C.

(*d*) *Man.*—As the animal experiments had proved satisfactory, the next step was to test the effect of

TABLE IV—ANTIBODY RESPONSE AFTER INTRAMUSCULAR INOCULATION OF HUMAN VOLUNTEERS

Subject.	Doses.	Titre of neutralising antibodies.		Increase.
		Before.	After.	
A	1	Nil.	Nil.	Nil.
B	1	1 : 1	1 : 1	Nil.
C	1	1 : 1	1 : 8	Eightfold.
D	2	1 : 1	1 : 3	Threefold.
E	2	1 : 2	1 : 8	Fourfold.
F	2	1 : 1	1 : 3	Threefold.
G	2	1 : 2	1 : 8	Fourfold.

the heated E.B.S. on human volunteers. Influenza has not been prevalent during the recent months and it was not possible to test the power of the vaccine to protect against spontaneous infection; antibody formation was therefore used to indicate the effect of the vaccines.

The sterility of the vaccine was tested by aerobic and anaerobic culture on blood agar, Robertson's meat medium, and Hartley's broth, and by intranasal and intracerebral inoculation of mice under ether anæsthesia. Negative results were obtained in all cases.

Seven volunteers were selected whose antibody titres were either nil or very low; 3 received one intramuscular dose only of 0·5–0·7 c.cm. and the others two intramuscular doses of 0·5 c.cm. In no instance was any general reaction observed; an extremely mild local reaction was reported on one occasion after a second inoculation of the suspension.

Blood was collected 11 or 12 days after the last dose; bleedings had also been taken before the injections. Quantitative neutralisations only were carried out, for the complement-fixation tests were irregular owing to the production in some instances of antibodies against mouse tissue. Comparative readings before and after the inoculations are given in Table IV.

The response of the individuals to immunisation was uneven. Two of the three persons receiving only one dose showed no stimulation of antibodies, but in all the others an increase in titre was obtained; this varied from three- to eight-fold.

These results are comparable with those obtained by other workers after the inoculation of formolised or living virus suspensions. It is important to note

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that the amount of E.B.S. inoculated (0·5 c.cm.) was relatively small and that there was also a relatively low concentration of virus in the E.B.S. Therefore under the circumstances the antibody response was satisfactory.

DISCUSSION

Elementary-body suspensions, heated at 57° C., constitute a useful immunising agent against infection with the influenza virus. This is a matter of interest, since it has usually been accepted that the inactivation of viruses by heat destroyed their immunising power.

The results obtained with mice and ferrets suggest that any differences given by the heated and living vaccines were due mainly to variations in the concentration of virus in the suspensions, as no attempt had been made to standardise the virus content of the different preparations by titration in mice. As a general rule enough saline was added to the elementary bodies to restore the original volume. Therefore in all cases the E.B.S. contained less virus than the crude living suspensions, as virus is lost during the various processes in the preparation of the elementary-body suspensions.

An appreciable antibody response was also obtained by the inoculation of human volunteers and also a rabbit, which is naturally refractory to infection.

These results suggest that heated E.B.S. should constitute an admirable immunising agent for general application. The preparation does not involve any complicated technical procedures, it is non-infective, sterile, and can be conserved for some time at 0° C. The addition of 0·5 per cent. phenol moreover acts as an excellent preservative. Much but not all extraneous material is eliminated; it was found that centrifuging the final preparation at low speed for 5–10 minutes is useful in removing some of the residual foreign material. Local reactions, even of a mild nature, were uncommon; as with other vaccines prepared from mouse-lung lesions, some response to the mouse tissue occurred as evidenced by the appearance of antibodies against mouse tissue.

A further important point is that the concentration of virus can be adjusted at will by varying the quantity of saline added during the final preparation of the elementary-body suspension.

Immunity following an attack of influenza is only of short duration. As there is no reason to suppose that artificially induced immunity will be as great as that following infection, specific prophylaxis is not likely to be beneficial except under certain circumstances. It appears necessary either to give a series of injections during the late autumn—i.e., before influenza usually occurs—or to wait until an extensive epidemic is expected.

In all cases it is essential to emphasise that any immunity produced is only temporary; in some cases it is possible that the response will be so slight that protection against infection will not result. Also protection is only to be expected against epidemic influenza and not against the sporadic forms, many of which are vague infections of the upper respiratory tract.

In order to control the efficacy of the vaccines serological tests should be carried out before and after inoculation. Complement-fixation tests are most convenient for the examination of large batches of sera and they are useful in determining individuals who are likely to be susceptible to infection. Owing to the production of antibodies to mouse tissue in inoculated individuals, this test, in which infected mouse lung is the antigen, is unsatisfactory for testing the antibody response to the vaccines; neutralisation tests should therefore be carried out unless another form of antigen, such as infected egg-membrane, is available.

SUMMARY

Protection experiments in mice and ferrets and antibody production in man and the rabbit indicate that suspensions of elementary bodies killed by heat at 57° C. constitute a satisfactory immunising agent against epidemic influenza.

Dramatic results are not to be expected from the use of immunising agents to prevent influenza in human beings, but in certain circumstances these should be of definite value.

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RETICULOCYTE RESPONSE IN ALBINO RATS AFTER INJECTION OF GASTRIC JUICE

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Singer (1935) and Singer and Wechsler (1936) maintained that the injection of normal gastric juice or gastric juice from subjects not suffering from pernicious anæmia caused a reticulocyte response in rats within 3–5 days of the injection. He thought that the response must be due to the presence of Castle's intrinsic factor in the gastric juice, for boiled normal gastric juice or gastric juice from pernicious anæmia patients had no effect.

Rauschenberg (1935) confirmed Singer's results.

Kamerling (1935) obtained positive reticulocyte responses not only after the injection of normal gastric juice but also after the injection of pepsin and HCl together, while there was no response to the injection of neutralised gastric juice and that from pernicious anæmia patients.

Fleischhacker and Schlesinger (1935) came to the conclusion that the positive reticulocyte response cannot be due to Castle's intrinsic factor, for they frequently obtained a positive response after the injection of gastric juice from pernicious anæmia patients. The positive response was sometimes late and sometimes extremely high. They further reported a case of true polycythæmia whose gastric juice did not cause any reticulocyte response when injected into rats.

Klaperzak (1936), working with pig's gastric juice or the stomach contents of pig's embryos, stated that Singer's reaction in rats could not be due to the presence of Castle's factor, but depended very probably on the presence of proteins in the gastric juice. Gastric juice deproteinised by ammonium sulphate was ineffective, and the gastric juice which

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was partly deproteinised by boiling for three minutes caused a positive response only in a small number of experiments, although Castle's intrinsic factor was not destroyed by this preliminary treatment.

Crosetti, Bajardi, and Margulius (1937) almost always obtained a positive reticulocyte response on the injection of gastric juice from subjects not suffering from pernicious anæmia and sometimes on the injection of gastric juice from patients suffering from pernicious anæmia. They divided the pernicious anæmia patients into three groups: (1) Untreated cases during decompensation. The reticulocyte response is almost always negative. (2) Cases during liver treatment. The response is sometimes positive, sometimes negative. (3) Compensated cases which have been without liver treatment for some time. The response is sometimes positive.

Rambert (1937) repeated Singer's experiments and confirmed his results. But the details of his experiments are not at all conclusive. The difference between his normal reticulocyte count and a positive response is too small and almost within the normal variations from day to day. One of Rambert's cases of pernicious anæmia gave a positive response, but as the injection of the heated gastric juice from the same patient gave the same response, the experiment is rejected as unsuitable. I propose to show that there is not much difference between the response to untreated and heated gastric juice. Only one rat was used for each of Rambert's 5 cases of pernicious anæmia and the reticulocytes were counted every other day, but only up to the sixth day after injection. This experimental procedure is too lax to produce reliable results.

The implication of Singer's work is twofold—namely, that the response is due to the presence of Castle's intrinsic factor, and that the absence of a response may be considered diagnostic of pernicious anæmia. Although subsequent workers have not confirmed Singer's work completely, the results are so important that it seemed desirable to repeat his experiments. The results reported in this paper indicate that the response cannot be due to Castle's factor and the test is of no diagnostic value in pernicious anæmia.

METHOD

The animals used have been albino rats weighing 150–200 g. Both sexes were used, and the animals were kept in separate cages on a diet consisting of bread and milk.

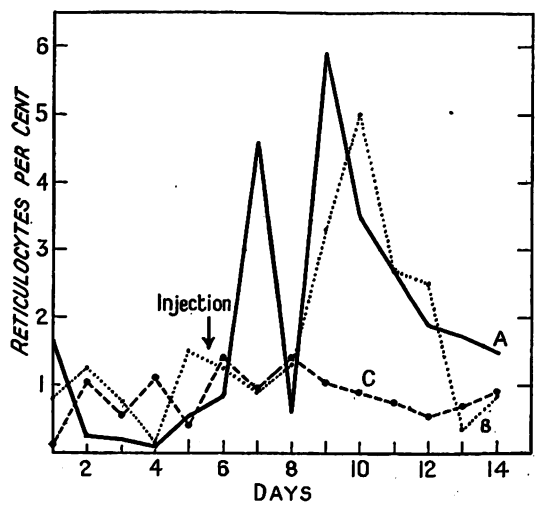

FIG. 1.—Reticulocyte response to subcutaneous injection of gastric juice obtained from a patient suffering from hypochromic anæmia and gastritis (no free HCl present after the injection of histamine; Table I, Case 3). Curve A shows the response to 4 c.cm. of gastric juice plus 1 c.cm. of saline (Rat 7); Curve B the response to 3·5 c.cm. of heated gastric juice plus 1·5 c.cm. of saline (Rat 18); and Curve C the response to 5 c.cm. of saline (Rat 16).

The blood was obtained daily from the tail veins by a slight cut with a razor blade. The blood was sucked up in a blood-counting pipette, mixed on a paraffin slide with an equal amount of brilliant cresyl blue solution (1 part saturated alcoholic solution of brilliant cresyl blue to 5 parts 1 per cent. sodium citrate in normal saline), and incubated at 37° C. for fifteen minutes. After incubation smears were made and counterstained with Jenner's stain. In normal periods 1000 red blood-cells were counted, but when the percentage of the reticulocytes was above the normal level 2000 were counted.

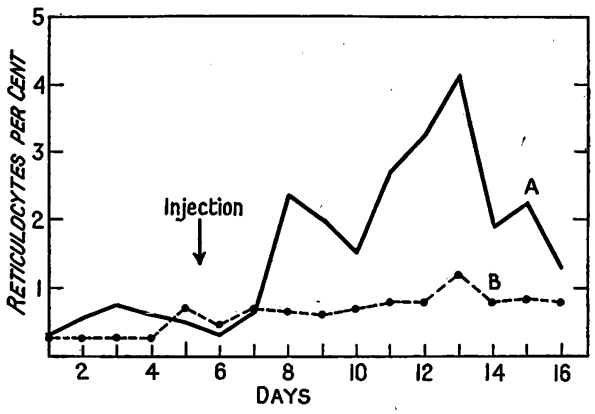

FIG. 2.—Reticulocyte response to subcutaneous injection of gastric juice obtained from a patient suffering from pernicious anæmia. The patient had never been treated for pernicious anæmia and there was no free HCl present after the injection of histamine (Table II, Case 4). Curve A shows the response to 5 c.cm. of gastric juice plus 0·5 c.cm. of saline (Rat 40), and Curve B the response to 5·5 c.cm. of saline (Rat 42).

The reticulocyte count in normal rats varies from nil to about 1·5 per cent. and is not altered by bleeding in the above manner over a long period (see control rats in Figs. 1 and 2). Rats which showed a large variation in their reticulocyte count were not used. Such variations were encountered only in rats which were in abnormal health.

The gastric juice was obtained by aspirating the stomach through a fine stomach-tube after 12 hours' fast. Both the resting juice and the secretion following the injection of 0·05 mg. histamine were used after filtration and neutralisation to litmus paper, if necessary.

The gastric juice was injected subcutaneously into the back of the rat in amounts varying from 2 to 5 c.cm., always made up to 5 c.cm. with sterile normal saline. In every batch of rats used for an experiment, one control rat was injected with normal saline only. The animals were injected after a control period of 5–8 days.

RESULTS

Specimen curves of the daily reticulocyte count are shown in Figs. 1 and 2.

The reticulocyte response of the rats to gastric juice from subjects not suffering from pernicious anæmia is tabulated in Table I. The average reticulocyte count was around 1 per cent. before injection. After injection 3–5 days elapsed before the reticulocytes began to rise. The reticulocyte peak was usually between 2 and 5 per cent. and remained high for a day or two, sometimes showing a second peak. No control rat in any of the batches showed a reticulocyte rise during the same period, so that a positive result could not be due to the daily bleeding. The response to the injection of gastric juice from normal subjects did not differ from that

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following the injection of gastric juice from patients not suffering from pernicious anæmia.

The figures in Table I do not suggest that the height of the reticulocyte rise is related to the amount of gastric juice injected (see, for example, Table I: rats Nos. 6 and 7; 5, 15, 7).

Singer maintains that he never got a reticulocyte response when he destroyed Castle's intrinsic factor in the gastric juice. In the experiments shown in part 2 of Table I, the intrinsic factor was destroyed either by heating the gastric juice for 30–40 minutes at 70°–80° C. or boiling it for 10 minutes. However, most of the animals responded very well to the injection, although the maximum rise was reached about a day later on the average.

Since the heat treatment used is known to destroy Castle's intrinsic factor (Castle, Townsend, and Heath 1930) the rise in the reticulocyte count cannot be due to the presence of Castle's intrinsic factor in the gastric juice.

Table II demonstrates the results obtained after the injection of gastric juice from four patients suffering from pernicious anæmia. The results are very similar to those obtained with normal gastric juice except that the peak of the rise usually occurred a day or two later. Moreover the response of the two rats which were injected with heated gastric juice from a pernicious anæmia patient show a good reticulocyte response.

TABLE I—RETICULOCYTE RESPONSE TO GASTRIC JUICE FROM SUBJECTS NOT SUFFERING FROM PERNICIOUS ANÆMIA

Case No.	Rat No.	Pre-injection period. Average per cent.	Pre-injection period. Maximum per cent. reached.	Post-injection period. Maximum per cent.	Post-injection period. Time in days after injection.	Gastric juice injected. Amount in c.cm.	Gastric juice injected. Cases.	No. of rats used.
UNTREATED GASTRIC JUICE								
1	6	0·53	1·60	3·45	5	3·5	Normal (J. F. B.).	2
	7	0·38	1·10	4·70	4	2·0		
2	9	0·20	0·50	2·00	4	5·0	Normal (G. P.).	3
	10	0·89	1·20	3·30	4	4·0		
	11	0·64	1·50	2·75	3	3·0		
3	5	0·85	1·40	2·90	4	5·0	Hypochromic anæmia, gastritis, free HCl 0.	3
	15	0·80	1·30	2·60	5	4·0		
	7	0·55	1·65	5·90	4	4·0		
4	21	1·04	1·70	3·25	4	3·0	Diabetes, free HCl 0.	2
	18	0·61	0·85	2·75 2·05	1 7	2·0		
HEATED GASTRIC JUICE								
2	12	1·06	1·25	1·75	3 5	3·0	Normal* (G. P.).	2
	14	0·30	1·10	1·70	3	5·0		
3	17	0·53	0·85	2·35	6	3·0	Hypochromic† as above.	2
	18	0·89	1·50	5·00	5	3·5		
4	15	0·88	1·25	3·70	5	1·5	Diabetes‡ as above.	2
	20	(1·73)	(2·75)	(3·75)	(6)	(2·5)		(1)
	19	(1·91)	(3·05)	(5·05)	(4)	(3·0)		

* Heated for 30 minutes at 70°–80° C.
† " " 40 " " 80° C.
‡ Boiled " 10 "

TABLE II—RETICULOCYTE RESPONSE TO GASTRIC JUICE FROM CASES SUFFERING FROM PERNICIOUS ANÆMIA

UNTREATED GASTRIC JUICE								
1	12	0·67	1·40	2·85	6	2·0	Pernicious anæmia after good response to liver treatment. Free HCl 0.	3
	13a	0·70	1·40	2·75	6	3·0		
	14	0·33	1·05	4·60	5	5·0		
2	26	0·54	0·90	2·75 2·70	1 7	3·0	Pernicious anæmia, untreated. Free HCl 0.	2
	27	0·41	0·95	3·30	8	4·0		
3	32	0·18	0·40	2·15	8	3·5	Pernicious anæmia, beginning subacute combined degeneration, slight treatment. Free HCl 0.	4
	34	0·35	0·75	3·20 3·45	7 8	3·5		
	35	0·41	1·40	2·90	7	2·0		
	36	0·21	0·45	2·70	7	2·5		
4	37	0·35	0·45	2·65	9	5·5	Pernicious anæmia, untreated. Free HCl 0.	5
	38	0·52	1·20	3·10	7	5·5		
	39	0·34	0·90	3·50	8	5·5		
	40	0·54	0·75	2·35 4·10	3 8	5·5		
	41	0·47	1·00	2·50 3·45	5 8	5·5		
HEATED GASTRIC JUICE								
1	10	0·98	1·30	2·80	6	2·0	Pernicious anæmia as above.*	2
	11	0·69	1·55	2·90	6	3·5		

* Heated for 30 minutes at 80° C.

CONCLUSIONS

Although the number of experiments is very small, the results justify the conclusion that the rise of the reticulocyte count after the injection of gastric juice is not due to Castle's intrinsic factor. According to the data given by Castle, his intrinsic factor should be completely destroyed by the heat treatment used in these experiments, and yet there is almost no difference between the results obtained with untreated gastric juice and those obtained with heated gastric juice.

Even if the positive response is not due to Castle's intrinsic factor, there is still the important clinical possibility that a negative result might be diagnostic of Addisonian pernicious anæmia. The number of cases tested in these experiments is small, but in all of them a positive result was obtained. Singer insists that the response should only be regarded as positive if the peak is reached within 5 days. By this criterion only three rats gave a positive response to the injection of gastric juice from pernicious anæmia. But the difference in the curves obtained from the gastric juice of normal cases and of pernicious anæmia cases is so slight and so inconstant that, whatever the meaning, it could certainly not be relied upon as a diagnostic test.

SUMMARY

1. The albino rat responds to the injection of gastric juice from subjects not suffering from pernicious anæmia with a rise of reticulocytes within 3 to 5 days.

2. Gastric juice from the same subjects, in which Castle's intrinsic factor is destroyed by heating or boiling, causes a similar reticulocyte response.

3. Gastric juice from patients suffering from pernicious anæmia causes a similar but usually delayed reticulocyte response in the rats.

4. The occurrence or non-occurrence of a reticulocyte response in rats receiving injections of human gastric juice is of no value in the diagnosis of pernicious anæmia.

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CLINICAL AND LABORATORY NOTES

A COLOUR REACTION FOR BENZEDRINE

By Derek Richter, M.A., Ph.D.

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In some subjects the effects of benzedrine appear to be transient, lasting only a few hours, while in others they may be felt for more than a day. In order to obtain more information as to the duration of the action of benzedrine the rate of excretion in the urine has been measured. Using the micro-method described below it was found that with doses of 20 mg. benzedrine sulphate in some subjects only 30–50 per cent. is excreted in the urine in 24 hours and benzedrine may still be detected in the urine 40 hours after administration.

Benzedrine gives a yellow colour with a number of nitrophenols, including picric acid, and this may be used as a convenient method of estimation for amounts down to 0·001 mg. per c.cm.

To 60 c.cm. urine in a 250 c.cm. separating funnel is added 6 c.cm. petroleum ether and 4 c.cm. 2N caustic soda solution. The mixture is shaken three minutes by a rotating motion to prevent froth formation, allowed to stand two minutes, and the aqueous layer run off. The petroleum ether layer is centrifuged five minutes, cleared by stirring with a glass rod, and centrifuged for a further two minutes. 3 c.cm. of the petroleum ether solution is measured in a dry pipette or 10 c.cm. measuring cylinder and washed with 3 c.cm. chloroform into a dry test-tube. 0·6 c.cm. of a solution containing 1 per cent. picric acid in toluene is now added. The tube is allowed to stand well corked for 12 hours during which time the picrates of other basic substances from the urine separate out; the clear yellow solution is then compared with a series of standards prepared in a similar manner from solutions containing 0, 1, 2, 5, 10, and 20 γ benzedrine per c.cm. For making the standards pure liquid benzedrine was used and the solution titrated with standard N/5 acid, but for many purposes it is sufficiently accurate to use a solution obtained by heating a 10 mg. tablet of benzedrine sulphate with 7·35 c.cm. water (the starch with which the tablets are made up does not interfere). The resulting solution contains 1 mg. base per c.cm.

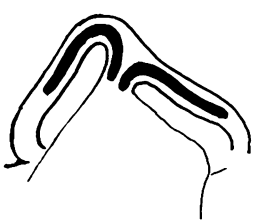
Normal urines often contain small amounts of amines which give a slight blank value corresponding to about 0·5–1·0 γ benzedrine per c.cm. The value of the blank must therefore be determined and subtracted from the values obtained after giving benzedrine. Small amounts of indole in the urine do not interfere with the estimation, but the formation of amines by bacterial decomposition must be avoided by adding a few drops of toluene and using the urines as fresh as possible. Traces of moisture or alkali in the tubes interfere with the estimation and it is essential that the tubes should be well cleaned with cleaning fluid and dried. If four separating funnels are used a large number of estimations may be made in a comparatively short time.

THE NOSTRIL IN SECONDARY HARE-LIP

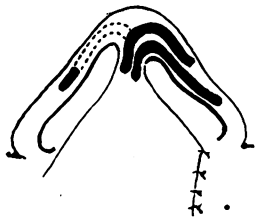
By Graham Humby, M.R.C.S. Eng.

The following operation is offered as an alternative to existing methods for the correction of the flattened nostril in secondary hare-lip. I believe that it gives a more positive result and enables one to over-correct the deformity in order to allow for the subsequent contraction of scar tissue.

The increased width of the base of the nostril is corrected in the ordinary way by resection of tissue and undermining. It is with the flattened portion on one side of the tip that we are concerned, and the object of the operation is to fold a portion of the alar cartilage of the normal side over to the flattened side after freeing the flattened cartilage from the skin above it; in this way the bent cartilage, by its natural elasticity, supports the flattened nostril.



The deformity.



Desideratum.

The knife is inserted at the lower edge of the flattened cartilage, and the freeing is done parallel to the superficial surface of it—i.e., between the cartilage and the skin. On the normal side, the lateral portion of the alar cartilage is resected submucously and folded over into the space which has been created on the flattened side between the cartilage and skin. No stitches are necessary.

Submucous resection.

Cartilage folded over.

Should it be feared that the normal nostril will collapse when bereft of its cartilage, a narrow margin of its lower border may be left in situ and not swung over with the rest to the other side; but the normal nostril tip is usually unduly prominent and a slight collapse does not detract from the final result. The manipulation of the alar cartilages does not involve any interference with the nasal septum.

Only a few cases have been submitted to this procedure, but the results obtained justify this communication.

IDIOSYNCRASY TO ACRIFLAVINE

By W. A. Young, B.M.Oxon., B.Sc.Lond., D.T.M.&H.
SENIOR MEDICAL OFFICER, SEWA HADJI HOSPITAL, DAR-ES-SALAAM, TANGANYIKA TERRITORY; AND

F. Hawking, D.M. Oxon., D.T.M.
SENIOR FELLOW IN TROPICAL MEDICINE, MEDICAL RESEARCH COUNCIL

The purpose of this communication is briefly to record a case of skin sensitivity to acriflavine.

On March 23rd, 1938, an Indian aged 38 was admitted to the Sewa Hadji Hospital for fever, vomiting, and bronchitis. He also had a chronic sinus in the left upper arm which had followed injury to the arm two years previously. The Wassermann reaction was negative. A few days after admission the sinus

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began to discharge a thin purulent fluid. On March 29th a plug of gauze soaked in 1/2000 aqueous solution of acriflavine was placed in the sinus, and a pad of similar dressing was placed round the arm. On April 1st it was found that the whole area of skin under this dressing was swollen, erythematous, and sore. It emitted numerous drops of fluid, mostly clear but some whitish and presumably purulent. The affected area formed a band about 3 in. wide round the upper arm and its boundaries accurately corresponded to those of the dressing. The patient stated that the same rash had appeared on many other occasions whenever this "yellow medicine" had been applied in outside dispensaries. The area was dressed with dry boric lint and later with ung. hyd. ammon. dil. spread on gauze. By April 9th the sinus was clean and granulating; the area of the rash showed many small red granulating areas about ¼ in. across, previously the sites of blisters.

Meanwhile a test had been made to confirm that this condition was indeed due to the dressing. A small pad of gauze was soaked in acriflavine 1/2000 and affixed to the patient's forearm by strapping. Next day the pad was removed, and no obvious lesion was found; but on the following day erythema and inflammation began to appear, reaching a maximum on the third day after the first application of the pad. There was considerable itching but no pain. On the seventh day the skin was still red, thickened, rough, and itching.

It has not been possible to search through the literature dealing with acriflavine, but no reference to any other case of sensitivity to this compound is known to us. Such sensitivity must be very rare. The dressing applied above is one of the commonest stock dressings in use at a large tropical hospital which treats a very great number of infected wounds and ulcers among a daily out-patient attendance of 500–600; and no case of sensitivity to it has previously been observed. It is interesting to note that there was a latent period of two or three days between the first application of the dressing and the beginning of symptoms. The patient's statement that the same rash had occurred at other (private) dispensaries suggests that the reaction was probably not confined to any one particular brand of acriflavine.

We are indebted to the deputy-director of medical services for permission to publish this case.

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE

SECTION OF MEDICINE

AT a meeting of this section held on May 24th, with Dr. H. L. TIDY, the president, in the chair, a paper on

Dietetic Treatment of Diabetes Mellitus

with special reference to high blood pressure was read by Dr. DENNIS EMBLETON. He described a standard diet containing about 150 g. of carbohydrate, about 120 g. of protein, and a variable amount of fat. The carbohydrate consisted of bread or biscuits, accurately measured, and fruit; the protein was a minimum allowance and might be exceeded; 1½ pints of milk was included later in the treatment, and the fat intake at all times was unrestricted. Sugar and alcohol were completely excluded and two motions of the bowels every day were insisted upon. This standard diet was prescribed for periods of 3–5 days, alternating with periods of 1–3 days on which nothing at all was to be taken except fruit, fruit juice, and water, yielding 180 to 240 g. of carbohydrate daily. This régime, usually without any insulin, was used in treating obese patients and diabetics of the relatively mild type, over forty years of age, whose sugar-tolerance curves even when high showed a fall towards normal within 2½ hours. Many such diabetics were also obese, and no sharp distinction between obese diabetics and obese non-diabetics could be made on the basis of sugar-tolerance curves, which in a series of 66 obese males showed every gradation from normal to frankly diabetic. In addition to the dietetic régime Dr. Embleton considered the elimination of focal sepsis very important. He showed many coloured charts displaying the effect of this treatment on individual cases. During two or three weeks' treatment acetonuria would disappear and glycosuria would diminish or disappear; the periods on fruit alone were specially effective in abolishing glycosuria. At the same time many records showed a steady fall of systolic blood pressure, from levels of 180 mm. Hg and over, down to within normal limits. Emotional upsets were prone to cause a temporary return of glycosuria. Reduction of weight was recorded in many cases and in some patients with impaired circulation to the legs warmth and sensation returned to the feet. The régime was suitable even for those undertaking the physical strain of high-class athletics.

Dr. H. P. HIMSWORTH considered Dr. Embleton's results an important contribution to the study of the pre-diabetic state. He recalled F. G. Young's work on the effect of injecting pituitary glycotropic factor into dogs, which became fat and developed glycosuria; these changes were reversible up to three weeks, but if the injections were continued longer a permanent diabetes resulted. He pointed out that these effects were obtainable in carnivora fed on flesh, not in carnivora fed on a vegetarian diet nor in herbivora. He suggested that the diet described by Dr. Embleton might exert a braking effect on the patients' pituitaries.

Dr. E. P. POULTON said that Dr. Embleton's diets were reminiscent of the diabetic régimes of the pre-insulin period, with their fast days; he asked which was important, the high protein or the limited calorie intake.

The PRESIDENT quoted Kipling to the effect that—

> There are nine and sixty ways
> Of construing tribal lays
> And every single one of them is right.

He regarded Dr. Embleton's diets as ideal for a fat man, who could eat his fill—for fat men always had good appetites—for five days a week and eat fruit in compensation on the other two. At the same time he accepted some of Dr. Embleton's cases as true diabetics.

Dr. EMBLETON, replying, said that his diets when analysed were not low in total calorie intake. For obese patients he used the standard diet only, for diabetics the standard diet and the fruit days. All the diabetic cases whom he quoted had been treated with insulin by leading consultants in diabetes before they came to him.

The Chronic Pneumonias

was the title of a paper by Dr. J. G. SCADDING. He accepted the conventional use of the term "pneumonia" to designate an inflammatory process in the lung predominantly characterised by exudation

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into the pulmonary alveoli. In chronic pneumonia this might be followed by organisation and fibrosis or by suppuration, and at any stage resolution might take place. Although Laennec and others in the nineteenth century had described this process and discussed its clinical aspects, it found no place in modern text-books of medicine except in the delayed resolution of acute lobar pneumonia. In 1936 Dr. Scadding had described three cases of "*chronic diffuse broncho-pneumonia*," in which small focal pneumonic lesions occurred widely scattered through the lungs, and showed in different places early consolidation, resolving consolidation, organisation, and suppuration. The illnesses had run a chronic course lasting from 3½ months to 2 years, ending fatally. In many respects, both clinically and radiologically, they had simulated chronic pulmonary tuberculosis. To that group he now wished to add three other groups of chronic pneumonias.

Chronic circumscribed non-suppurative pneumonia was a term that described the usual type of delayed resolution of acute pneumonia, which had been shown radiologically to persist for up to 85 days after the acute onset. The consolidation must be supposed to persist during that time in a state of suspended activity, for complete clearing could follow without fibrosis, and without suppuration. In the same group belonged other cases which began insidiously or with only mild initial symptoms. He described an example in a man of 56, in which consolidation spreading out from the right hilar region developed insidiously, persisted for several weeks, and completely cleared; sputum was scanty throughout and contained no tubercle bacilli; the X ray appearances had strongly suggested bronchial carcinoma.

Chronic suppurative pneumonia without gross abscess formation was a condition in which consolidation was followed by both organisation and suppuration, the latter dominating the clinical picture but occurring in scattered small foci without coalescence into abscess cavities. An example was described in a man of 38, in whom the pneumonia began at the right base and extended into the right middle zone; it lasted at least three months, with irregular fever and profuse purulent sputum which was not malodorous; clubbing of the fingers developed during its course; recovery followed treatment by postural drainage, and left only some residual basal fibrosis.

Chronic suppurative pneumonia with abscess formation was a commoner condition. In an example described, the history was similar to that of the previous case, but the duration was six months and at one stage a small cavity in the centre of the consolidated area was revealed by X rays. The characteristics of the group were irregular consolidation, incidental breaking down of small areas into abscesses, and a spreading tendency with the occurrence of fresh areas of consolidation in hitherto unaffected parts of the lungs. Dr. Scadding held that this process accounts for those cases of lung abscess described as of apparently "primary" origin (8 per cent. to 38 per cent. in various published series of lung abscess); the chronic pneumonic changes found post mortem round such abscesses should be regarded as the primary process, not as secondary to the suppuration. Laennec had described and interpreted these changes in that way.

In the bacteriological examination of sputa of seven cases of chronic suppurative pneumonia, Dr. Scadding had found no clue to its ætiology; even Vincent's organisms seemed to be secondary invaders. In treatment he had obtained no lasting benefit from arsenical preparations or sulphanilamide; postural drainage according to Nelson's principles was of value; large abscesses not draining into a bronchus had to be treated surgically, but where a diffuse suppurative pneumonia of any extent coexisted the improvement following surgical drainage was often limited.

Dr. PHILIP ELLMAN emphasised the importance of some of these forms of chronic pneumonia because of their resemblance to pulmonary tuberculosis, which, incidentally, might also heal by resolution. It was a great misfortune for a non-tuberculous patient to be condemned to a diagnosis of pulmonary tuberculosis.

Dr. SCADDING, in reply, agreed that some cases of his chronic diffuse (focal) broncho-pneumonia could be distinguished from tuberculosis only by long watching and repeated sputum examination.

Pulmonary Complications after Operation

Some aspects of post-operative pulmonary complications were discussed by Dr. N. C. OSWALD, who said that accurate diagnosis of these conditions had become possible only in the last ten years, with the help of radiography. At Charing Cross Hospital he had examined 710 post-operative cases, using X rays, and 11 per cent. of these had shown pulmonary complications. The figures were higher (about 30 per cent.) for upper abdominal operations than for lower abdominal operations (about 5 per cent. for appendicectomies and hernias), and highest for perforated peptic ulcers (about 50 per cent.). There were two main types of complication, bronchitis with or without broncho-pneumonia, and atelectasis. Both appeared in the first four days, and they could be differentiated sometimes by signs and symptoms, sometimes only by radiography. Bronchitis alone caused fever, cough, sputum, and physical signs in the chest, with no abnormal shadows in the skiagram; it was commoner in chronic bronchitics and in those operated on during acute upper respiratory infections. Bronchitis might proceed to broncho-pneumonia, with signs of consolidation and shadows in the lower zones. In other cases broncho-pneumonia followed atelectasis. In others again some broncho-pneumonia was found post mortem in patients whose general condition had been too poor to enable them to survive the operation performed; in these the pulmonary complication was not to be regarded as the cause of death. The second group of complications, those with atelectasis, constituted half of Dr. Oswald's cases. The collapse was lobular or lobar; true massive collapse, involving two or more lobes, had not occurred in his series. Atelectasis was accompanied by fever and cough, with the production of a drachm or two of sputum, for a few days.

On a first analysis complications seemed to have occurred twice as frequently in patients over 40 years old as in those under 40. In the older group, however, operations in general were more extensive. When large operations were taken separately, the incidence of lung complications above and below 40 was the same; but when only small operations were considered, the complications were twice as common in patients over 40. Death had occurred in 36 cases: in 4 (aged 48–66) from lung complications directly, in 9 partly from lung complications, in 4 from pulmonary embolism, and in 19 from causes not connected with the lungs. In 263 deaths occurring at Guy's Hospital after major abdominal operations the figure for pulmonary embolism had been similar—namely, 10 per cent.

Pulmonary complications showed the same incidence after operations under spinal anæsthesia as after those

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under general anæsthesia, the types of operation in the two groups being similar. There was also little indication of any seasonal influence on the incidence of complications. Dr. Oswald showed a number of slides illustrating the radiographic appearances in his cases.

In the discussion that followed several speakers raised the question of treatment; the PRESIDENT drew attention to the well-known rise in the platelet count 10–14 days after operation and its possible relation to pulmonary embolism.

Dr. OSWALD, replying, estimated that rather less than half the cases of post-operative atelectasis of the lung might be expected to recover without any treatment; treated by posture, four out of five would be expected to avoid pneumonia. He had no experience of bronchoscopic treatment, and he saw no advantage in carbon dioxide inhalations, which tended to force sputum further down the bronchi. He agreed that it was of great importance that a patient under the influence of morphia should be made to cough properly.

SECTION OF EPIDEMIOLOGY

AT a meeting of this section, Sir ARTHUR MACNALTY presiding, Dr. J. ALISON GLOVER read a paper on the incidence of

Tonsillectomy in School-children

He pointed out that the incidence of operations upon the tonsil in this country remained low until after the beginning of the twentieth century. About 1902–03 a rapid rise began. There was a partial lull during the war years, after which the rise accelerated sharply, reaching a peak in 1931. There was then a sharp fall. In 1936 a second rising curve began. Dr. Glover noted that the incidence is higher upon boys than upon girls, but the age-distribution is somewhat older in girls. The highest age-incidence is upon the period 5 to 7 years, the peak being usually in the sixth year. Dr. Glover's plea was for more attention to sex and especially to age-grouping in considering the necessity for operation, and in assessing its results. The recent work of I. M. Epstein and others had suggested that the present age-distribution is too young for the best results to be got. The high incidence between 5–7 years was probably due to operations on tonsils for enlargements which are either (1) physiological, associated with the great changes in development and in the oral cavity which take place at this critical period; or (2) immunological, in response to the unaccustomed herd infections of the new environment of school, or to the sepsis sometimes resulting from the decay of the primary dentition. A study of the geographical distribution in elementary school-children disclosed no correlation between the rate of incidence and any impersonal factor, such as overcrowding, poverty, bad housing, or climate. Incidence was not correlated with the general efficiency of the school medical and dental services of the area. In fact it defied any explanation, save that of variations of medical opinion on the indications for operation. Large and in some cases drastic reductions in the numbers of operations performed in elementary school-children in certain areas had had no unsatisfactory results. Puzzling as was the geographical distribution the social distribution was yet more of an enigma. Tonsillectomy was at least three times as common in the well-to-do classes. The more fortunate the child in all other circumstances, and the better the opportunities for careful nurture, so much the more was he liable to tonsillectomy. In the public schools the picked athletes among the boys were tonsillectomised in exactly the same proportion as the other boys in the schools. Mr. T. B. Layton had pointed out in 1931 that the mortality from the operation was larger than was generally appreciated, and the Registrar-General's figures for the 5-year period 1931–35 showed that on a conservative estimate 85 children under 15 died each year from tonsillectomy. Though the removal of tonsils was always something of a gamble, in certain cases it had brilliant results. Unfortunately the recollection of these dramatic successes had often led to operation without adequate cause, or sufficient regard to the possibility of enlargement being temporary, physiological, or immunological. The variations in practice and the other anomalies to which Dr. Glover had drawn attention suggested that the probability that the tonsil served some useful purpose, its tendency to spontaneous involution, and the success of non-operative methods of treatment were often overlooked in a too hasty resort to symptomatic treatment. He concluded that the facts of incidence of tonsillectomies supported the opinion, expressed on other grounds by the schools epidemic committee of the Medical Research Council, that "it is a little difficult to believe that among the mass of tonsillectomies performed to-day all subjects for operation are selected with true discrimination, and one cannot avoid the conclusion that there is a tendency for the operation to be performed as a routine prophylactic ritual for no particular reason and with no particular result."

DISCUSSION

In the subsequent discussion no opposition was offered to the view that mass tonsillectomy was a useless and might be a dangerous prophylactic measure, although in cases carefully selected for operation, after a reasonable period of observation, its results were excellent.

Dr. LEWIS GLOVER said he had observed that if children in whom the operation was refused were subsequently examined it would be found that the great majority had passed into the group in which operation was not necessary.

Dr. W. H. W. ATTLEE agreed that the incidence of tonsillectomy had gone up. In the school in which he was interested the proportion of new entrants who had been tonsillectomised had been 20 per cent. in 1908–10 as against 80 per cent. at the present time. Perhaps as the result of this, the type of throat infection encountered had altered. Follicular tonsillitis was now rare but in its place a generalised pharyngitis was seen, occasionally with pharyngeal abscess.

Mr. T. B. LAYTON remarked that he had first adopted a conservative attitude in 1911 and that experience had strengthened, and not weakened, this attitude. He refused to admit that the function of the tonsil was unknown: it was the largest and most important of the protective subepithelial lymphatic glands. He outlined the precautions which should be taken in selecting cases for operation. The time taken to give an opinion on the advisability of operation should never be less than the time taken to perform the operation—and he was a slow operator. Practically never should operation be decided upon at the first visit. He had given up operating during the winter and he would never operate at the time of a measles epidemic on a child who had not had measles. Harmful results from unnecessary tonsillectomy were greater in poor children than in those of the well-to-do. Tonsillectomy never cured recurrent colds and the case of otitis media which was difficult

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to cure was that in the tonsillectomised child. Tonsillectomy in adults was an entirely different problem and should never be discussed on the same basis as tonsillectomy in children.

Mr. E. D. D. DAVIS also emphasised the occasional severity of non-tuberculous adenitis in the tonsillectomised child.

Dr. PERCY STOCKS admired Dr. Glover's moderation of language in putting up what he thought was an overwhelming case. The best that could be said was that the position was even worse in the United States. Apparently the figure in England and Wales for the whole population was about 25 per cent., whereas a recent American inquiry estimated that 54 per cent. of an unselected sample of the population had been tonsillectomised. He thought that the tendency towards tonsillectomy would be difficult to reverse.

Dr. R. P. GARROW agreed about this, as he thought that a great many of the "strange facts of incidence" brought out by Dr. Glover could be explained by the anxiety of parents—and particularly of mothers—for their children. This would explain the social incidence and even, perhaps, the sex-incidence.

REVIEWS AND NOTICES OF BOOKS

Diseases of Infancy and Childhood

Second edition. By WILFRID SHELDON, M.D., F.R.C.P. Lond., Physician for Diseases of Children, King's College Hospital; Physician to Out-patients, Hospital for Sick Children, Great Ormond-street; Consulting Pædiatrician to the L.C.C. London: J. and A. Churchill. 1938. Pp. 739. 21*s*.

Sick Children: Diagnosis and Treatment

Third edition. By DONALD PATERSON, B.A. Manitoba, M.D. Edin., F.R.C.P. Lond., Physician, Hospital for Sick Children, Great Ormond-street; Physician for Diseases of Children, Westminster Hospital. London: Cassell and Co. 1938. Pp. 604. 12*s*. 6*d*.

BOTH these text-books of children's diseases covering much the same ground have not only justified their existence but have proved their popularity. Dr. Sheldon's book was first published in 1936, and the second edition of Dr. Paterson's only last year. One does not therefore look for any very profound changes in either manner or matter. Both authors now include references to the sulphanilamide group of drugs and to the salts of mandelic acid. Dr. Paterson has further revised the section on the anæmias, and written a new section on acute and chronic antritis. Dr. Sheldon has recast the section on intrathoracic tuberculosis, and includes an interesting discussion on hypersensitivity to tuberculin. We would remind him that oxygen tents which he couples with mandelic acid as therapeutic agents of proved value in 1938, but "still on trial" and therefore not included in 1936, have been in general use in American children's hospitals for at least ten years. The reproduction of many of the radiograms in Dr. Sheldon's book is much improved by their transfer to special plates. In future editions he should adopt a consistent style for the references given at the foot of the pages. When one considers that the authors have shared the privilege of a long association with the same great children's hospital and the teaching of Still, Hutchison, Poynton, and Thursfield, it is refreshing to see what an individual and distinctive approach each brings to his subject.

Lippincott's Quick Reference Book for Medicine and Surgery

Tenth edition. By GEORGE E. REHBERGER, A.B., M.D. London: J. B. Lippincott Company. 1937. Pp. 1354. 65*s*.

THE appearance of a new edition of this book is an event of importance to many doctors, especially to those who, working in remote places, are cast much upon their own resources. This new edition follows the same general plan as previous ones, but the whole work has been revised. Much new material has been added, including an article listing the recent advances in endocrinology and notes on the Prontosil group of drugs and protamine zinc insulin. In a book of such wide scope notes on treatment must necessarily be short and not all Dr. Rehberger's therapeutic suggestions will meet with general approval. The advocacy, for example, of mechanical restraint as a means of treating masturbation savours of the last century, and the treatment of primary amenorrhœa by intensive coitus sounds a heroic remedy hardly applicable in a civilised world. The vast number of synonyms used in medicine makes for a good deal of tiresome cross-reference for which the author cannot be blamed. The reader however, has cause to complain if, when he looks up "vitamins," he is referred to the note on "food-values"; in these circumstances the epithet "quick reference" loses its significance. On the other hand, no praise is too high for the zeal and thoroughness with which, apparently single-handed, Dr. Rehberger has tackled his immense task. The book is profusely illustrated with plates, charts, and diagrams. A pharmacological index and a table of equivalents of metric and apothecaries' weights and measures are appended.

Orthodiascopy

By CHESTER M. KURTZ, M.D., F.A.C.P., Assistant Professor of Medicine, University of Wisconsin; Cardiologist to the State of Wisconsin General Hospital. London: Macmillan and Co. 1937. Pp. 247. 15*s*.

ORTHODIASCOPY is a radiological method of determining the exact size and outline of the heart which is popular in America and Germany. The author finds that it has several advantages over the simple teleradiographic pictures in ordinary use in this country. The book is of interest to the cardiologist as well as to the radiologist and contains case-histories and some interesting statistics on deviation from the normal. The technique is described at length and the full examination includes an orthodiagraphic tracing of the silhouette of the heart with careful measurements, an ophthalmoscopic examination, and an electrocardiogram. The actual tracing is fairly simple, but it is laborious, as it has to be carried out in each of four positions—anterior, posterior, right oblique, and left oblique. Finally the heart is projected on to the chest wall with the patient standing as for an ordinary screen examination. It must be remembered that it is the size of the heart in diastole which is an important guide to the condition of the muscle. Areas are measured by means of a planimeter and are compared with the normal predicted values for the individual on the basis of age, height, and weight. These are deemed important and much

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space is devoted to the methods of compiling probability tables. Nomograms which determine the predicted frontal area and transverse diameter are included. There are chapters on the findings in various diseases—rheumatic, syphilitic, and congenital—and in coronary hypertension and pericarditis. The method is elaborate and would be difficult to carry out in an ordinary diagnostic radiological department, but for special cardiac clinics it offers another, and a very accurate, method of assessing the functional ability of the heart.

Tumeurs intracraniennes

By HARVEY CUSHING, Professor of Neurology in the Faculty of Medicine, Yale University. Paris: Masson et Cie. 1937. Pp. 194. Frs.80.

THE original American version of this monograph was noticed in our columns on its appearance in 1932 (see *Lancet*, 1932, 2, 192). Its object was to present the operative results, with the case-mortality percentages in different categories of intracranial tumour, of a series of 2000 verified cases treated in the author's clinic. Quite apart from these statistical results the reader gets from the book a remarkably clear bird's-eye view of the clinical and pathological aspects of the subject, set forth with Cushing's characteristic ease of style and beautifully illustrated by many photographs and drawings. The French version which follows a translation into German by F. K. Kessel is not significantly altered; here and there is an amplifying note, while a small paragraph has been added on the basophil adenomas of the pituitary, in which the view is expressed that these tumours, like the acidophil variety, are more sensitive to irradiation than are the chromophobe adenomas. The volume is expanded by the addition of an appendix by W. P. Van Wagenen and one by Hugh Cairns. In these are summarised the results of independent follow-up investigations of the two groups of cases studied while the author was acting as assistant at Cushing's clinic. Their full reports have appeared elsewhere and we published two years ago an abridged account of Cairns's investigation.

Methods of Treatment

Sixth edition. By LOGAN CLENDENING, M.D., Clinical Professor of Medicine of the University of Kansas. London: Henry Kimpton. 1937. Pp. 879. 42*s*.

IN this book Prof. Clendening's avowed purpose—certainly an ambitious one—has been to bring together all therapeutic procedure within the compass of a single volume. Part I is devoted to descriptions of the various therapeutic procedures under their appropriate headings. In Part II therapeutic application is considered and an attempt made to indicate what result is to be expected from a certain line of therapy in any given disease. In that it makes for clarity and obviates the need for repetition, the plan is sound but, unfortunately, the descriptions given in Part I are often too sketchy to be helpful. In this edition the author has revised his ultra-conservative views on the value of treatment by artificial pneumothorax and has rewritten this chapter in the light of what is now widely accepted knowledge and practice. Among other new material is an account of the use of scarlet fever toxin as an immunising agent, of pertussis vaccine, and of the treatment of delirium tremens. The new references to protamine zinc insulin, to sulphanilamide, and to cyclopropane anæsthesia are far too short, and the note on mandelic acid does not explain in what circumstances it should be given and omits any mention of the simultaneous use of ammonium chloride. According to the preface this edition should contain also a note on staphylococcus toxoid, but this is not to be found in the text nor is it referred to in the otherwise adequate index. The statement that no good results have yet been obtained from the use of convalescent serum in measles will surprise many, and the author's ready facetiousness, surely misplaced in a book of this kind, is apt to pall. Nevertheless this is a painstaking piece of work which does much of what it sets out to do and includes many valuable suggestions such, for example, as the intranasal use of pituitary extract, advocated by Slemon, in the induction of labour.

Clinical Atlas of Blood Diseases

Fourth edition. By A. PINEY, M.D., M.R.C.P., Consulting Physician, International Clinic, Tunbridge Wells; Assistant Physician, St. Mary's Hospital for Women and Children; and STANLEY WYARD, M.D., M.R.C.P., Physician, Royal Cancer Hospital, London. London: J. and A. Churchill. 1938. Pp. 127. 12*s*. 6*d*.

IN this fourth edition much of the text has been rewritten and five new plates have been added. No index is provided, but to facilitate reference the table of contents has been arranged in alphabetical order and page numbers have been appended to the entries in the glossary. It is disappointing to find so little reference to the important diagnostic procedure of sternal marrow puncture. In the section on glandular fever the diagnostic value of the presence of peculiar agglutinins for sheep and of cells in the serum is not noted. The 42 somewhat diagrammatic but good illustrations compensate for the style of the text which is too jerky and telegraphic to make easy reading.

Text-book of Bacteriology for Dental Students

Second edition. By ARTHUR BULLEID, M.R.C.S., L.D.S. Eng., Dental Surgeon and Lecturer in Special Bacteriology to the Dental School, Guy's Hospital. London: William Heinemann. 1938. Pp. 207. 15*s*.

THIS little book sustains its claim well that it is able to give the dental student and practitioner "an insight into the bacteriology of general disease without forgetting his special needs in his own sphere—the mouth." It is conventionally written but it includes all that is generally demanded in English examinations on dental surgery. The subject is treated from a severely practical standpoint; the author has no doubt found, like others experienced in the teaching of bacteriology to dental students, that they imbibe the subject much better from technique than from theory. The sections on the special bacteriology of the mouth are interesting and authoritative, but they serve as a reminder of the need of further systematic work on the microbiology of the mouth. The section on the streptococci, a relatively important subject to dental surgeons, might have been rewritten in better orientation with current work on the subject and the sections on immunity are over-brief and not very illuminating. On the whole, however, the book is adequate for its purpose, indeed it stands almost alone in this country as an introduction to bacteriology suitable for the needs of dental students.

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THE LANCET

LONDON: SATURDAY, JUNE 4, 1938

DRUGS REVINDICATED

THE neurophysiologist of ten or even five years ago despised drugs as being far too variable and uncertain in action to be worth serious study in his line of work; he regarded as far more profitable experiments which gave precisely measurable records of neuromuscular activity. But in the last five years the chemists and the pharmacologists have made him swallow his scorn. As Sir GOWLAND HOPKINS remarked in our columns last week, "chemistry made an unexpected and impressive appearance in the physiological arena"; the work of Sir HENRY DALE and his school, built on the foundations sketched years ago by T. R. ELLIOTT and laid by OTTO LOEWI, has bridged the gap that lies between the end of a nerve-fibre and the cell to which that fibre takes a stimulus, and has bridged it apparently with a purely chemical process. Proceeding along the nerve-fibre the physiologist may think and experiment in terms of ionic changes and electrical potentials, but when he reaches the nerve-ending he must now picture an explosive shower of big honest chemical molecules some of which, descending on the body of the cell to which the fibre leads, rouse it to activity. In some of these fibres (pre- and post-ganglionic parasympathetic, pre-ganglionic sympathetic, and post-ganglionic sympathetic vasodilator fibres, fibres to sweat glands, and motor fibres to skeletal muscles) the molecules are those of acetyl-choline. Scarcely has the shower descended on the recipient cell before it is made to evaporate by the enzyme choline esterase, lying in wait for it; so that the stimulation of the cell is very brief and the field is clear for its repetition within a very short space of time. Some recipient cells, but not all, may be shielded from the stimulating shower by the presence of atropine. On the other hand the choline esterase is inhibited or inactivated by the presence of eserine, which therefore intensifies the stimulative effect of the acetyl-choline; and that property of eserine has made possible this whole fascinating experimental exploration of chemical transmission at nerve-endings. The thesis is still not without its gaps and inconsistencies, but in spite of some opposition it has gained general acceptance, and directly and indirectly has begun to influence clinical thought and clinical experiment. It was therefore opportune, and for the physician most welcome, that Prof. F. R. FRASER should take its clinical aspects as the subject of his Croonian lectures delivered before the Royal College of Physicians of London last week and this.

After expounding the main thesis, summarising the evidence on which it rests, and giving a list of the various neuromuscular and autonomic functions which have been proved to depend on "cholinergic" innervation, Prof. FRASER went on to examine the action of acetyl-choline when introduced into the body from without. In animals, given in large enough doses into the blood stream, it has been shown to produce all the physiological parasympathetic effects, together with certain sympathetic effects from sympathetic ganglionic stimulation, and contraction of striped muscle-fibres. These effects are all transient, because the substance is so rapidly destroyed by the esterase present in the blood itself as well as in the tissues. Some of them may be obtained in man by intravenous injection, notably vasodilatation, fall in blood pressure, and slowing of the heart, the last even to the extent of transient standstill; but again the rapid destruction by esterase makes the effects very brief, and almost entirely forestalls them when the acetyl-choline is given subcutaneously or intramuscularly. It follows therefore that, although acetyl-choline given by one of those routes has been recommended in the treatment of paralytic ileus, hypertension, vasospastic conditions, varicose ulcers, epilepsy, cerebral thrombosis, and acrodynia, its therapeutic use in these conditions is ill-founded; nor has it met with acceptance from critical observers.

In theory, the desired effects should be obtainable if the acetyl-choline could be protected from the esterase. The equivalent of this has been achieved by the synthesis of two related substances which have broadly the same pharmacological actions as acetyl-choline and are chemically much more stable. These are carbaminoyl-choline, known as Doryl, and acetyl-β-methyl-choline, known as Mecholin. Doryl, given subcutaneously in man, causes flushing and sweating, salivation and lacrimation, fall of blood pressure and bradycardia, peristaltic unrest in the gastro-intestinal tract, and increased tone in the bladder leading to micturition. Its intensity of action varies from time to time and from subject to subject, and tends to be greater on the stomach, the gut, and the bladder than on the cardiovascular system; its duration is from 20 to 40 minutes, or rather longer on the intestine and the bladder; when excessive, its action can be counteracted by atropine. In therapeutics its usefulness has been proved in the management of post-operative abdominal distension, and of post-operative or post-partum retention of urine. The effects of mecholin, in man, resemble those of doryl fairly closely, both in nature and in duration. On the cardiovascular system, however, they are relatively more pronounced, and on the gastro-intestinal tract and bladder less so. Consequently mecholin has found its greatest therapeutic success in the treatment of supraventricular paroxysmal tachycardia, in which its vagus-like inhibitory action, either alone or reinforced by carotid sinus pressure, will more often than not check the paroxysm.

An alternative way of producing these parasympathetic and other effects is to protect the body's own acetyl-choline from rapid destruction

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by esterase, and thereby intensify the effect of whatever nerve impulses are physiologically passing down the nerve-fibres concerned. This can be done by the pharmacologist's old favourite, eserine (physostigmine), or by its new synthetic mimic, Prostigmin, preferred by the clinician. In man, prostigmin exerts a greater effect on the intestine than on the cardiovascular system, and like doryl has been found distinctly useful in reducing abdominal distension after operations; both drugs give best results if they are followed by enemata. The most dramatic prostigmin effect, however, is its restoration of power to the weak muscles in myasthenia gravis, an action which invites the suggestion that the muscles are weak because the physiological acetyl-choline production at their nerve-endings is deficient. Prof. FRASER quoted other observations, however, which show that a fuller and more complicated explanation will be required before the myasthenic mechanism is made clear. In this connexion, fairly large doses of prostigmin are necessary, and they must often be combined with atropine, which blocks its undesired influence on heart and intestine without impairing its effect on striped muscle.

We have mentioned only a few simple and conspicuous features emerging from three lectures packed with close argument and factual detail, and we have chosen those which offer accredited help in the everyday practice of medicine rather than those which open up new and interesting possibilities for the investigator. Much has yet to be learned about acetyl-choline transmission—assuming that the theory has come to stay—in various parts of the body; adrenaline-transmission at sympathetic nerve-endings has not yet been analysed; there is still the question of synaptic transmission within the central nervous system; and the synthesising chemists are not likely to stop at two or three new substances. Out of it all will come, no doubt, a most interesting chapter of physiology, and some contribution to the practice of medicine. Meanwhile the day is already past when a cynic could say to the student conning his pharmacopœia, "It is mostly rubbish; you can count all the drugs you really need on the fingers of two hands."

EMERGENCY BED SERVICE FOR LONDON

IN his presidential address to the council of the King's Fund on May 27th the DUKE OF KENT announced that the voluntary hospitals emergency bed service would begin operations on June 21st. The service will be controlled by a committee under the chairmanship of Sir HAROLD WERNHER, and its main feature will be a central office through which acute cases can be admitted to hospital without delay. The organisation of the service has necessitated a great deal of preliminary work by the Voluntary Hospitals Committee and by the hospitals concerned. Hospitals have had to alter their internal arrangements for the admission of patients to avoid delay, and to some extent they have had to abrogate their selective powers as far as emergencies are concerned. Arrangements have been made for a staff capable of dealing efficiently with about 100 inquiries a day from doctors, and finally about £3000 a year has had to be guaranteed by the King's Fund to cover the cost of the scheme.

The central office will be at the headquarters of the King's Fund and here a record, corrected twice daily, will be kept of the beds vacant in all the London voluntary hospitals. These will be shown by tickets of different shape and colour, according to sex and medical classification, on a large indicator board, so that the details of available accommodation can be seen at a glance by any of twelve operators. A doctor who wishes to arrange for the admission of an acute case will telephone the particulars with his diagnosis to the office and will be told as soon as possible whether there is a vacancy at the hospital he favours, and if not whether there is one elsewhere. Arrangements have been made too with the London County Council by which their ambulances can be booked through the service if necessary. In this way the familiar pointless calls to a succession of hospitals will be saved. The service will be open every day from 8 A.M. to 10 P.M. to begin with, during which period about four-fifths of all emergency calls arise, and will of necessity be something of an experiment.

All doctors living within 11 miles of St. Paul's will be notified by letter of the working details of the service, and of the telephone number of the central office, which will not be published in the directory so as to avoid calls direct from the public. Although they will receive no official notification we trust the service may be available to doctors outside the metropolitan area, who are in fact responsible for 40 per cent. of the admissions to some London hospitals, and to whom the time and expense involved in telephone calls under the present arrangements is almost intolerable.

TONSILLECTOMY AS A PROPHYLACTIC RITUAL

As long ago as 1923 Sir GEORGE NEWMAN issued the first of his many warnings against premature resort to tonsillectomy, urging the adoption of a more conservative attitude. His words were not heeded. Among the elementary school-children of England and Wales there are official records of some 42,000 tonsillectomies in 1919, 110,000 in 1931, the crest of the wave, and nearly 81,000 in 1936. The school medical officer for London said in 1931 that more than a third of its elementary school-children had been operated upon by the time they left school at 14. And the recent report of the school epidemics committee of the Medical Research Council [1] shows that at least half the boys and girls entering certain typical public schools have undergone tonsillectomy. There is then no basis for argument about the fact of increase; only the necessity for it can be a matter of contention. J. ALISON GLOVER and JOYCE WILSON [2] were unable to find valid evidence of a reduced incidence of

[1] *Spec. Rep. Ser. med. Res. Coun., Lond.* 1938, No. 227.
[2] *Brit. med. J.* 1932, 2, 506.

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illness following tonsillectomy on a wide scale, or statistical support for the theory that it closes an entrance for infections or respiratory diseases; it is fair to add that many specialists in diseases of the ear, nose, and throat are convinced from personal observations that the removal of greatly enlarged tonsils is beneficial to general health as well as preventing local or general infections.[3]

It is, however, the mass rather than the individual attack that has raised doubts which will be strengthened by data, briefly summarised on another page, presented by Dr. GLOVER on May 27th at a meeting last week. In this return to the charge he has left "the strange facts of incidence to speak for themselves." And strange indeed are some of the figures he gave. For example, taking the operation rates on elementary school-children in 1936 as an index of incidence it seems that a child living in Rutlandshire or the Soke of Peterborough is 19 times more likely to undergo tonsillectomy than one living in Cambridgeshire; an Enfield child 20 times more likely than one in Hornsey; and one living in Bexhill 27 times more likely than the child in the somewhat less desirable environment of Birkenhead. Apart from a belt of high rates on the South Coast, extreme variations throughout the country present themselves, entirely unrelated so far as one can see to environment, circumstances, efficiency of school medical or dental services, or to any recognisable factor. Rural county A with an average annual attendance of 2207 elementary school-children had 1010 operations in the nine years 1928–36. At the same rate rural county B, not far distant, and with an average attendance of 8621 children, would be expected to record 3945 tonsillectomies; the actual number was 335. Environment and social circumstances were not unalike, and yet it seems that 3610 who would have been operated upon had they lived in A were not operated upon because they lived in B. Can there be a rational explanation of such geographical differences? It seems either that some areas must be over-active or others neglectful of their duties.

All figures to which Dr. GLOVER has had access show a higher incidence of operation on boys than on girls. Yet, he points out, acute tonsillitis seems to fall on male children no more heavily than on female, the recorded incidence of sore-throat in boarding-schools is higher in girls (though differential accuracy of recording may well play a part in this difference), and acute rheumatism is higher in elementary schoolgirls than in boys. In regard to age Dr. GLOVER gives the distribution in four series, hitherto unpublished, which agree in showing roughly two-thirds of the operations taking place at ages 5–8. He emphasises that this period in the life-history of a child is a time of great change not only in his oral cavity and in his general development but usually in his environment as he passes from the familiar infections of the home to the "herd" infections of the school. Is it not possible, he asks, that many of the operations performed between the ages of 4 and 6, ages of rapid development, remove tonsils which are enlarged physiologically or in response to their protective function? And may not some of the improvement ascribed in such cases to tonsillectomy be really due to physiological changes which normally take place at this stage in the child's life? In assessing the after-results of operations, this question of age is, of course, of fundamental importance and no control can be regarded as valid which ignores it.

If we can accept the figures on social incidence at their face value, it is the well-to-do child, better housed and better nourished, whose need for tonsillectomy is greatest. The incidence is at least threefold heavier on the children of the affluent. Of boys entering one of our most famous schools in recent years the school medical officer reports the nearly incredible figure of 83 per cent. operated upon before entry. If such an operation is a necessary concomitant of modern life, to which we must reluctantly submit our children for the sake of their health, then any relapse from these Spartan standards should be followed by dire results. The examples quoted by Dr. GLOVER do not confirm such fears. In Hornsey Dr. R. P. GARROW, on appointment as school medical officer, reduced the number of operations from an annual average of 169 to only 13. No evidence of retribution in the returns for otitis media or other conditions has accumulated. On a larger scale was the reduction introduced in Derbyshire by Dr. W. M. ASH from over 2000 operations per annum before 1931 to less than 200 a year since that date. In other words, in six years some 13,000 children in the county have been reprieved. To secure statistical evidence of the effect is not easy, but it seems that school attendance has not suffered and compares well with the average, while the incidence of deafness, otitis media, and enlarged non-tuberculous cervical glands has not increased. Other county medical officers likewise report no unsatisfactory results following conservative treatment in large numbers of cases. There certainly seems a strong case for restraint coupled with observation of developing children over a period of years with careful records not only of the morbidity, local and general, but of the size and appearance of the tonsil.

[3] *Post-grad. med. J.* 1934, 10, 6.

MEDICINE AND CHARITY

THE defeat of the St. Bartholomew's Hospital Bill is a temporary but serious set-back to the scheme for a paying-patients' block. For some fifteen years the hospital has had the idea of providing for the class of men and women who are unfitted for admission to the general wards but yet cannot afford the expense of private treatment in the ordinary nursing-home. St. Bartholomew's was one of the first in bestirring itself in this direction. It is to-day almost the only one of the London teaching hospitals which has no pay-beds. Its funds are vested in charitable trust for the benefit of the sick poor. The Select Committee of the House of Lords, in rejecting the Bill, was evidently impressed by the argument that

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the patients with an income of £500 to £1000 a year who are able and anxious to be admitted as paying patients cannot be included under the description of "sick poor." The Voluntary Hospitals (Paying Patients) Act of 1936 enabled hospitals to use accommodation for paying patients if it was not required for other patients. The Lord Chancellor took the view that the new Bill sought to devote to paying patients resources which were actually required for the express purposes of the trust. The Attorney-General's representative could thus argue that the proposed block for paying patients would be brought into being at the expense of charitable funds, and that those funds could only be restored to their original and proper purpose if the paying-patients' block was a commercial success. In these circumstances the progress of the Bill was hopeless, though it offers the logical remedy for difficulties which Parliament acknowledged and placed on record in the preamble to the St. Bartholomew's Hospital Act of 1935. Whatever the Parliamentary position, the result for St. Bartholomew's is that the hospital is at a comparative disadvantage, and its efficiency may suffer. The rebuilding programme has produced magnificent wards for surgical and medical cases; the paying-patients' ward has had to wait. If the general funds of the hospital must not be used for the patient of moderate means, private donation is the only remaining resource. Where is the generous donor who will step into the breach?

On the larger question, however, it is clear that the proper place of charity in the provision of hospital services requires reconsideration. Though most people are willing to subscribe a little money for relieving the really poor, only a few very rich people feel called upon to subsidise medical attention for the middle classes. Yet such subsidies must be provided in some form if a large proportion of the population—termed in America the "medically indigent"—are to get the benefit of modern science; for the family with £750 a year cannot purchase full medical care in the open market. Failing "charity" there is the alternative of State aid, and Prof. ERNEST BARKER chose a highly topical subject for his address to the British Hospitals Association conference last week when he compared hospitals to universities as suitable recipients of grants from public funds. The State, he said, pays about £20,000,000 a year to the universities through the University Grants Committee, attaching no conditions to the payment; and he suggested that similar recognition of the value of hospitals to the community would enable them to continue their work without curbing their voluntary spirit or drying up the springs of private charity. How long these springs will continue to run when the standards of municipal hospitals have risen to the standards of the best voluntary hospitals it is, of course, hard to say, and with unification of the hospital services of every locality grants from public funds would no doubt play an increasing part in maintaining every kind of hospital. In the meantime there is a logical case for direct support from the State for those hospitals which carry on the education of medical students from the time when they proceed from the heavily subsidised medical schools to the end of their clinical course. It is surely important for senior students to learn their work of handling, dieting, and mending sick people in institutions whose services are unhampered by constant financial anxiety.

ANNOTATIONS

MORTALITY OF TRANSPORT WORKERS

IT does not require a great deal of sagacity to recognise the fallacy of using the mean age at death as a measure of the occupational hazards of those employed on different kinds of work. For example, the mean age at death of bishops, as William Farr pointed out three-quarters of a century ago, is very much higher than the corresponding average for curates; but conferring upon all the curates episcopal authority will not necessarily save them from an early grave. The average age at death in an occupation must depend in part, it is obvious, upon the age of entry to that occupation and the age of exit from it—if exit takes place for other reasons than death. Few men are so fortunate as to become bishops in early life and so there can be no risk of death at young ages in that august group. Few men cease to be bishops before they die but they may well cease to be curates. The curates lose both on the swings *and* the roundabouts.

Our attention has been called to the publication (*Lilliput*, April, 1938, p. 375) of figures purporting to show the length of life in certain occupational groups, which exemplify this patent but still not uncommon fallacy. These figures, calculated from data published by the Registrar-General and entitled "the average length of life," appear to be merely the average ages at death of differently employed men dying in 1921–23 (estimated from the mortality tabulated in the Registrar-General's Occupational Mortality Supplement relating to those years). The averages range from nearly 71 years for the Anglican clergy and for barristers to only 39 years for a group called "busmen" (actually, it seems, bus and tram conductors only). It would be idle to refer to so valueless a contrast if it were not being put forward seriously as evidence of the disadvantages of the busmen's conditions of employment. It can, of course, provide nothing of the kind. At the census of 1921 the majority of bus and tram conductors were of ages less than 35 and this young age-distribution can certainly be ascribed not to their early disappearance by death but to the relative youth of the industry on a large scale and to the recruitment after the war of a young and expanding staff. In 1921–23 there can have been but little time for most busmen to have lived to their natural duration of life. Those who died must have died at relatively early ages, merely because the total population was composed of persons at those ages.

The proper assessment of their mortality experience against that of males in other occupations would be the comparison of the death-rates at equivalent ages in the two, or more, groups, or a comparison of their standardised mortality-rates. Figures of the latter type show that the three groups, omnibus and tram conductors, motor-drivers, and tram-drivers, each had in 1921–23 rather *lower* mortality-rates

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than all males. Such better figures might well be expected, for the transport groups are composed of men selected as physically fit for an exacting type of work and on that ground alone should enjoy an advantage over the general population of males. Whether the advantage shown is as great as it should be or is reduced by occupational disadvantages cannot be said. The official figures for 1930–32 to be published shortly may throw some light on it. It is common knowledge that a large and socially important body of men firmly believe that their health is affected by their working conditions; the question whether this is true is still under investigation. A report by the Industrial Health Research Board gave some support to this view and further inquiries are being pursued by a committee appointed early this year by the Ministry of Labour. In the meantime it is a pity that anyone concerned should be misled by fallacious statistical reasoning; as Farr said, discussing similar evidence relating to dressmakers, "false arguments injure instead of aiding their cause."

SURGICAL TREATMENT OF CUSHING'S SYNDROME

IT cannot yet be claimed that any form of treatment for Cushing's syndrome has met with great success. The prospects are perhaps brightest when the disease is due to a tumour of the suprarenal cortex, because surgical removal of the tumour may then bring about a cure if it is done before malignant changes have taken place. Such a result was nearly achieved by Cahill and his co-workers,[1] and though their patient succumbed to metastases a year after operation a remarkable return to normal health and appearance had been noted in the interval. In the absence of any clinically demonstrable tumour in the suprarenal region or elsewhere the disorder is usually attributed to a primary pituitary dysfunction, and efforts have accordingly been made to depress the activity of the anterior lobe by deep irradiation. Attempts of this kind have not in general been rewarded by sustained improvement. A more drastic attack along the same lines is the implantation of radon seeds into the anterior lobe, and elsewhere in this issue will be found an account by Mr. Pattison and Dr. Swan of the effects of this operation upon two typical examples of the syndrome, in which previous deep radiotherapy had brought no improvement. Two radon seeds, each of two millicuries dosage with gold screenage, were implanted through incisions in the diaphragma sellæ in the first case, and in the second, where a part of the anterior lobe had already been removed at an earlier operation, three seeds representing a total dosage of 9 millicuries with platinum screenage were inserted. The remarkable and unexpected effect of this treatment, in both cases, has been a great improvement in subjective health. In the first patient this was accompanied by a loss of the facial hirsuties and plethora, slight lowering of the blood pressure, and more frequent menses; in the second a diminution of plethora was the only objective change. Further experience will doubtless determine the value of this form of treatment, but optimism at the present moment must be qualified by the evidence of its failure in the case recently reported by Maclay and Stokes.[2] Here two radon seeds were implanted by Prof. Hugh Cairns in the anterior lobe of a woman exhibiting the syndrome, but no improvement in her condition was recorded and necropsy about a year later showed considerable focal destruction of the tissue at the site of implantation. It is of interest that no tumour was found in any of the endocrine glands, and future work may possibly show this to be an unsuitable class of subject for implantation of radon.

[1] Cahill, G. F., and others, *Surg. Gynec. Obstet.* 1936, **62**, 287.

[2] Maclay, W. S., and Stokes, A. B., *J. Neurol. Psychiat.* 1938, n.s. **1**, 110.

GAS ATTACKS AND PANIC

ACCORDING to 10 Cambridge scientists [1] the purpose of A.R.P. in Great Britain is not to protect the public but to set up a system whereby it can be regimented into obedience and restrained from panic. The main object of their small monograph [2] seems to be to shake confidence in the Government. One complaint they make is that the measures officially recommended for the protection of the civilian population are grossly inadequate, but they estimate that the sum needed for the provision of air-raid shelters for all would be something between 425 and 700 million pounds. They pour scorn on the "bucket and spade" precautions against incendiary bombs and on the fact that information and instruction has to be sought instead of being officially provided. The question is perhaps one of relative values and urgencies.

Besides its politically flavoured allegations of "a tragic deception" of the people, the survey contains some sound if not very original comments on the dangers to be anticipated from the use of high-explosive bombs and bombs of mixed type alternately with gas. The authors may well be right in regarding gas as rather a red herring, and civilian gas-masks as something of a placebo. It is not clear that they have ever tested one of these masks; one obtained from a London firm, and similar in all ascertainable respects, was found definitely inadequate to keep out diphenylcyanarsine in very low concentration. It must not be forgotten, however, that the civilian mask is not intended for prolonged use in gas in high concentrations, but chiefly to enable the wearer to move out of the area where the gas is concentrated or to supplement the protection of a gas-proofed room; and the chance of protecting an undrilled population with any but the simplest pattern of respirator is very slender. There remains for consideration a doubt—implied though not specifically stated—whether a spare room in a well-constructed house can be made reasonably proof against gas. Nobody supposes that the walls of a house can do more than greatly delay the entry of gas from the outside. But in testing the *exit* of carbon dioxide from a room the Cambridge group ignore the fact that there is always more or less breeze on the outside of a house; a high concentration of a readily diffusible gas like CO_2 could not be kept up outside for more than a few seconds, and so the chance of much *entering* would be slight. The rate of penetration of liquids or smokes would of course be very much slower; in fact smokes would be kept out completely, and liquids with heavy vapours would only penetrate very slowly, as the Home Office experiments quoted on p. 38 clearly show.

To deprecate these criticisms does not imply satisfaction with our knowledge. There may well be a tendency to place undue faith on the proofing

[1] Air Raid Protection: the Facts. By a Committee of the Cambridge Scientists' Anti-War Group. *Fact*, April, 1938.

[2] Breathe Freely! The Truth about Poison Gas. By James Kendall, M.A., D.Sc., F.R.S., professor of chemistry in the University of Edinburgh; formerly lieut.-commander in the United States Naval Reserve, acting as liaison officer with Allied Services on Chemical Warfare. London: G. Bell and Sons. 1938. Pp. 179. 3*s*. 6*d*.

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of rooms, because gas-proof dugouts were found effective during the war, when conditions were much more favourable, and further experiments by the Home Office on a larger scale might provide valuable information. Meanwhile we suggest that those who are alarmed by the 10 Cambridge scientists should turn to a Scottish one to hear the arguments on the other side, expressed with sanity, temperance, and humour. Prof. James Kendall, F.R.S., is careful to exclude the Royal Society, the University of Edinburgh, and the United States Navy Department from any responsibility for his statements. Though he treads on many toes in passing, he stands essentially on his own feet. His primary object is to examine in detail the question of the dangers of air attacks on Great Britain in the hypothetical next war and to place the facts and possibilities before the public in proper perspective. His conclusion is that the creation of panic is the only real reason for an aggressor using poison gas on a large city, and that therefore panic is the only real danger. There is no reason to expect that our morale would prove inferior to that of any other country if we had to be put to the test, and the plans so far made for preparing us find a good deal of support not only from the standpoint of "common sense" but from Dr. Rickman's arguments as a psycho-analyst, published on another page of this issue.

THREE RHEUMATISM RESEARCH FELLOWS

AT a luncheon given at the Athenæum Club on May 26th Lord Horder announced the appointment by the Empire Rheumatism Council of three whole-time research fellows. Dr. C. B. Dyson and Mr. H. J. Taylor, Ph.D., will work at present in the laboratory built and equipped by Mr. Alexander Maclean at the Hospital of St. John and St. Elizabeth. Dr. W. S. Tegner, who holds the Sir Alexander Walker travelling scholarship, will spend a year studying methods of treatment at clinics in Europe and North America. Dr. Dyson has been engaged for seventeen years in pathological research at St. Mary's Hospital, Paddington. Dr. Taylor has been working for ten years at the St. John Clinic, Pimlico. Lord Horder emphasised their appointment as the spearhead of a movement for intensive research into the causes of rheumatic diseases. Other whole-time workers would be appointed as funds became available.

APPENDICECTOMY FIFTY YEARS AGO

WE have received the following letter from Southern Rhodesia:—

DEAR SIR,—It may interest you to know that it is now just on fifty years since the first operation of the removal of the vermiform appendix was performed. It was performed in I think June 1888 by Mr. (afterwards Sir) Frederick Treves upon myself at my father's house. I thought you might perhaps care to refer to it in your journal as the operation subsequently became so usual. (I wish Mr. Treves and I had patented it.)

I am, yours faithfully,
SAMUEL JAMES SMITH.

Mr. Smith may well be right for on Feb. 4th, 1888, Mr. Treves had reported to the Royal Medico-Chirurgical Society a case of relapsing typhilitis in a man aged 34 in which he had intended to remove the appendix and did not. The abdomen was opened during a symptomless period after the subsidence of a second attack, and a kinked appendix was found which became straight at once after division of its mesentery. Treves forbore to remove it; the patient made a perfect recovery and up to the time of the report had remained free from further relapses. To Morton of Philadelphia is given credit for the earliest of all successful appendicectomies (in 1887), and in this country Treves had many runners-up. At the same meeting of the Royal Medico-Chirurgical Society Mr. Timothy Holmes reported removal of part of the appendix of a man aged 30, and Mr. Howard Marsh mentioned the case of a girl who died from peritonitis from whom he had too late removed the appendix. Mr. Thomas Bryant, on the other hand, said he had never removed the vermiform appendix, although he felt there must be cases in which it was desirable. How the demand later grew in volume was recalled by Colonel Thornton on p. 1256 of our last issue.

THE DIRECTION OF THE MARIE CURIE HOSPITAL

WHEN in 1925 the decision was reached to develop a scheme of controlled research in the treatment of uterine cancer by radium, at four hospitals staffed by medical women, a director was needed to coördinate methods and to analyse and record results. It so happened that Dr. Elizabeth Hurdon was available and willing to accept a post for which her previous experience had fitted her so well. Though born in Cornwall and an M.D. of Toronto, it was mainly at the Johns Hopkins University that she gained this experience, first in pathology under W. H. Welch, and later as assistant, as instructor, and finally as associate in gynæcology, when she took her surgical fellowship. She worked, taught, and published jointly with H. A. Kelly during the period, early in this century, when the renown of the clinical research in progress at this famous centre was attracting students from all over the world. Before she started work with radium she informed herself by visits to the pioneer centres of this form of therapy of the most suitable technique, modified it where this seemed desirable, and, on the adoption of a uniform procedure by the surgeons attached to the several hospitals, took responsibility for the dosage. The incorporation of the four clinics into one unit, the Marie Curie Hospital, took place in 1929; and the results achieved at this hospital under her direction at first with radium alone and more recently with X rays also have achieved wide fame as, in the words of Dr. Henri Coutard, among the best in the world.

Dr. Hurdon's decision to resign from her arduous post, which is recorded in the ninth annual report of the hospital, was made long enough in advance to enable the authorities to arrange for an overlap of two years during which her successor, Dr. M. D. Gilmour, has worked closely with her. The comment of the board of management on the inestimable service rendered by Dr. Hurdon to clinical research in the treatment of cancer by irradiation will be endorsed by her fellow-workers at home and abroad.

OTOGENOUS NON-PURULENT ENCEPHALITIS

FROM time to time a case of suppurative otitis is reported, with symptoms suggestive of cerebral abscess, in which an exploratory operation is performed, sometimes more than once, but no pus is found and the patient finally makes a complete recovery. A few fatal cases also are on record where post-mortem examination has revealed no abscess but an area of softened hæmorrhagic brain tissue. If the patient recovers one cannot exclude the possibility that an abscess has formed and been absorbed, or that it has become encysted, though the latter is improbable

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if there are no subsequent symptoms. Jerlang[1] of Copenhagen describes a case of this nature and has collected some 18 others, and he gives a useful account of the clinical features of the condition. The diagnosis is extremely difficult. Sometimes the symptoms are so vague and atypical that the affection is either misinterpreted or is not recognised at all. In Jerlang's case cerebral puncture was performed in five different directions and cerebellar puncture in three, and this procedure was repeated after five weeks, without striking pus, but the patient slowly made a complete recovery and has remained well for eighteen months. Usually the diagnosis will be reached by exclusion with the help of the further course of the disease. The temperature, however, is usually high and often of the septic type, and a subnormal temperature has never been recorded. The pulse-rate, too, is ordinarily proportionate to the temperature and there have been no cases with true bradycardia. Lumbar puncture is no help in the diagnosis, for the cerebro-spinal fluid may present any variety of picture, from normal to turbid with numerous cells, with or without increase of pressure. Most cases have been treated as cerebral abscess, which could never be excluded with certainty, and fortunately exploratory puncture is not likely to increase the encephalitis.

There seems to be no doubt that otogenous encephalitis stopping short of suppuration is a clinical entity, and knowledge of its existence is important in the estimation of the prognosis of apparent cerebral abscess when puncture fails to reveal pus. The surgeon must not consider such a condition hopeless and on that ground be tempted to incise the brain without restraint. Although a few reported cases have ended fatally the prognosis on the whole is good, and not only as regards life. For even when intracranial symptoms have been severe they have nearly always subsided entirely.

A VETERAN OF LEGAL MEDICINE

THE Medico-Legal Society, at its meeting on May 26th, enjoyed an informal address by Dr. L. A. Weatherly, who is perhaps its oldest member and certainly its oldest active member. Dr. Weatherly was born in 1850 and qualified in 1873, so that his experience far antedates that of many practitioners who have long retired from active life. About once a year he delights the society with some selection from his stored wisdom; as the president, Sir Travers Humphreys, remarked, the society has good nights, better nights, and Weatherly nights. This time his reminiscences included an account of a case in which the police suspected a certain barrister, of notably eccentric conduct, of causing the death of a woman whose body was found in a train arriving at Waterloo; but they did not find enough evidence to justify a charge. Some years later the barrister became a patient of Dr. Weatherly's in his private asylum at Bath. In the course of his treatment he obtained the full confidence of the patient and was allowed access to his diary. This showed that on the day of the murder the man had been staying with friends at Bristol. Inquiries supported the diary, and it became clear that he could have had no knowledge of the murder. Dr. Weatherly remarked that it had always been a great satisfaction to him that this patient had died without knowing of the suspicion against him. Dr. Weatherly's paramount interests have always been in psychiatry, and it is naturally that aspect of legal medicine, rather than its more commonly emphasised pathological side, that most appeals to him. His concluding remarks gave a clue to his dominant outlook on life. It is quite clear, he said, that we live in a big world which contains within itself another big world of mentally abnormal people. This second world is the one in which he has spent most of his working life, rubbing shoulders with psychoneurotics day after day for 55 years. He has found that far above the value of medical treatment of any kind is the value of a kindly word, a shake of the hand and a clap on the shoulder, which bring comfort and happiness to people whom the world calls demented. He would like his epitaph to be "He tried to be a friend to the insane."

[1] Jerlang, E., *J. Laryng.* May, 1938, p. 283.

J. J. ABEL

LAST week we announced that Prof. John Jacob Abel of Johns Hopkins Hospital had been elected a foreign member of the Royal Society: this week we have to announce his death. He was 81 years old, having been born at Cleveland in 1857. He began his career as a schoolmaster and later as school superintendent, went to Johns Hopkins as a graduate student in 1883, and did not take a medical degree till 1888, when he was working at Strassburg. His prolonged sojourn in German, Austrian, and Swiss laboratories and clinics ended in 1891, and a little later he was appointed first holder of the chair of pharmacology at Johns Hopkins University which he was to occupy for nearly forty years. His achievements in it included the final isolation of adrenaline in a chemically pure state and the crystallisation of insulin; but possibly more important than any of his own investigations was the influence he wielded through so many years, both as professor and as editor of the *Journal of Pharmacology and Experimental Therapeutics*. In awarding him its Willard Gibbs medal in 1926 the American Chemical Society announced that it was "for having done more than any living American to promote the human enjoyment of life without pecuniary advantage to himself." In England, besides the recent membership of the Royal Society he received an honorary degree from Cambridge in 1920 and a gold medal from the Society of Apothecaries in 1928. He was president of the American Association for the Advancement of Science in 1932, and in late life, as emeritus professor, was director of the laboratory for endocrine research at Johns Hopkins. In the past few years he and his collaborators there have been working on tetanus toxin and have given reasons for believing that it does not, as is generally assumed, travel to the central nervous system through the peripheral nerves but has a powerful direct action on voluntary muscles.

THE library endowment fund of the Royal Society of Medicine stands to benefit to the extent of nearly £34,000 under the will of the late Colonel Cecil Birt, late A.M.S. Colonel Birt was a regular user of the library, and the bequest was made spontaneously as an appreciation of the services rendered by the library to the fellows of the Society.

THE Lister medal for 1939, in recognition of distinguished contributions to surgical science, has been awarded to Prof. RENÉ LERICHE, who occupies the chair of clinical surgery in the University of Strasbourg. He will deliver his Lister memorial lecture next year at the Royal College of Surgeons of England. This is the sixth award, which is made by a committee representative of the Royal Society, the Royal College of Surgeons of England, the Royal College of Surgeons in Ireland, the University of Edinburgh, and the University of Glasgow.

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CONTROL OF THE COMMON FEVERS

POLIOMYELITIS

Reviewed by SIR ARTHUR MACNALTY, K.C.B., *Chief Medical Officer of the Ministry of Health*

IN a recent address[1] I drew attention to the necessity for every field epidemiologist to be a competent clinician. If a comprehensive attack is to be made on an outbreak of epidemic disease, it is equally important for the competent clinician to have some acquaintance with epidemiology. No better example of this can be found than in the treatment and control of epidemic poliomyelitis. Wickman,[2] by studying small circumscribed settlements, first showed that from the village school as a centre poliomyelitis spread in a radial or concentric manner, and demonstrated that individuals with the non-paralytic form of the disease were able to transmit it to others who in turn developed paralysis. It is now well established that infection may be conveyed by :—

(1) Persons suffering from an acute typical attack of poliomyelitis; (2) individuals having a mild or atypical form of the malady; (3) healthy persons who have been in contact with infection, but have not themselves developed an attack; and (4) chronic carriers who have, apparently, quite recovered from a previous infection.

Infectivity in acute cases is greatest during the early stages of the disease. It is also useful to the medical practitioner to know that cases of the polio-encephalitic type are occurring with greater frequency in modern epidemics of poliomyelitis in this country. It puts him on the alert for their recognition. It is for this reason among others that the Ministry of Health continues to schedule polio-encephalitis as a separately notifiable disease, instead of merging it in the notifications of poliomyelitis.

The medical practitioner, therefore, faced with an outbreak of poliomyelitis should not confine his attention to the diagnosis and treatment of his individual patients. His coöperation in the steps taken by the health authorities to control the epidemic will be of the utmost value, and he can only do this with benefit to himself, the community, and his patients, if he appreciates the epidemiological considerations involved, above all, that poliomyelitis is transmitted mainly by personal contact and through the medium of mild or abortive cases and healthy carriers.

INCIDENCE AND SEASONAL PREVALENCE

Compulsory notification of the disease has been in force since 1912 in England and Wales. The reported prevalence of poliomyelitis and polio-encephalitis in England and Wales during ten years together with the number of deaths (in parentheses) is given in the following table :—

Year ..	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936
PM ..	801 (112)	452 (112)	532 (85)	506 (108)	339 (63)	656 (103)	714 (135)	590 (82)	633 (97)	530 (66)
PE ..	95 (70)	89 (55)	91 (55)	85 (56)	55 (35)	94 (75)	83 (67)	82 (53)	67 (48)	53 (36)

PM = Poliomyelitis. PE = Polio-encephalitis.

Even an approximate estimate of the incidence of the disease upon the general population cannot be given because, as in other countries, owing to failure to recognise the mild and abortive forms a considerable number of cases are never notified. The incidence must be controlled by many factors, of which probably the more important are the intensity of the outbreak, the virulence of the causal virus, and the susceptibility of the population.

Notification, nevertheless, is of the utmost value in revealing the existence and locality of the disease and in enabling measures of control to be exercised by the medical officer of health with the support of medical practitioners in the affected area. Particular emphasis, therefore, is to be laid on notification and to the need for notifying mild and abortive cases recognisable in times of epidemic prevalence.

Seasonal prevalence must be remembered. The disease prevails in this country in the warm months of the year, July, August, and September, August being usually the month of maximal case incidence. Winter epidemics have been recorded in Sweden and in West Virginia and, indeed, poliomyelitis may occur in any month of the year either in sporadic or in epidemic form. Dry and warm weather appears to favour the virus. It has been suggested that the variable character of the British climate protects us from the occurrence of such extensive epidemics as have arisen in the United States, in New Zealand, and in Australia.

Administrative Control

In the present state of our knowledge, the only effective administrative methods of control are the isolation of patients and contacts. Poliomyelitis is spread by "droplet infection" from persons harbouring the virus. But the facts previously considered relating to mild and abortive cases and "healthy carriers" indicate that these cases so far outnumber the identifiable cases that isolation of known cases and contacts can only exert a limited effect in checking the spread of the disease.

The recent Australian epidemic recorded 1615 cases with 87 deaths in Victoria alone by the middle of January last. Towards the end of 1937 the epidemic spread from Victoria to Queensland, South Australia, New South Wales, and Tasmania. No federal action to enforce interstate quarantine measures was adopted, but the States of New South Wales, South Australia,[10] and Tasmania have required certification of non-contact and surveillance of children coming from Victoria.

Yet, whilst isolation can only exert a partial effect, our experience at the Ministry of Health indicates that much can be done with the whole-hearted coöperation of medical officers of health and general practitioners to check the spread and severity of an epidemic. If the infectivity of the disease is appreciated, the existence of mild and abortive cases realised, and these as well as the more easily recognisable cases are notified and isolated in hospital or otherwise, potential sources of infection are shut off from susceptible individuals, and the epidemic spreads to a much lesser extent than if uncontrolled.

To cope successfully with any epidemic of poliomyelitis a large amount of field work must be intensively done in order to trace the source of case-to-case infection, as much as possible, and to discover and to isolate all child contacts. Dr. C. R. Merrillees gives an interesting account of this field work in the Victorian epidemic.[3] As usually occurs when this field work is properly and thoroughly

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done, he traced many multiple family cases and chains of contact infection. Concerning adult spread he writes :—

"Now this adult spread, if it does indeed occur, does not do so frequently, and the cost of interrupting the whole of the State's trade, not only in money, but in ultimate loss of health would be great, and it would be absurd to go back to the early Dark Ages and isolate each little district."

My own experience indicates that exceptionally an adult carrier may transmit the infection of poliomyelitis, but for practical purposes the child contact is the danger.

ISOLATION AND SCHOOL CLOSURE

It is difficult to say how long a patient remains infectious. He should, at all events, be isolated from other children for six weeks and personal association with him limited to the minimum necessity for proper care and nursing. Those in attendance should remember that infection may be conveyed from the nasopharyngeal secretions, the urine, and excreta. A strictly surgical standard of nursing is required, and nurses should be advised to use nasal sprays or douches, and to gargle the throat with normal saline solution. A solution of potassium permanganate, 1 in 5000 in normal saline, has been found to inhibit the action of the virus. The nasal instillation of sodium alum or tannic acid in 4 per cent. solution has been advocated. Picric acid and zinc sulphate sprays have also been recommended. The Canadian results with zinc sulphate nasal sprays indicate that this method of prophylaxis is ineffective.[4] The Consultative Council to the Victorian Government stated there was no evidence that the use of antiseptic sprays or gargles played any part in preventing poliomyelitis.[3] Some authorities, indeed, are of opinion that the employment of chemical antiseptics is liable to destroy the virucidal properties of the normal secretion of the nasopharynx. Children in the affected household should remain away from school for a period of three weeks after isolation of the patient, but, as already observed, complete restriction need not be placed on adult members of the household, provided they remain well. In regard to the closure of residential schools, the balance of advantage is in favour of not closing a school on the appearance of poliomyelitis. If the school be closed, any potential infection is more widely distributed (not infrequently in homes containing younger children), and passes beyond such supervision and control as are furnished in a well-equipped school conducted on hygienic lines with special attention to spacing and ventilation. Expert care and treatment of the patient where medical forces are marshalled to combat poliomyelitis are perhaps likely to be more effective in such a school than at home.

While this advice in general favour of the non-closure of schools remains unaltered, it is only right to add that the circumstances of each epidemic in residential schools require very careful consideration in deciding what is best to be done in a situation of admitted difficulty.

The Victorian experience of day school closure is interesting but inconclusive. In rural areas where the school is the sole meeting place of children school closure was found to be a useful measure, but in certain communities where it is extremely difficult to prevent children mingling out of school it was only of limited use. The report adds :—

"Education in a civilised community is of such vital importance . . . that drastic shutting of schools cannot be recommended by responsible authorities without very careful consideration of all the factors concerned."[3]

THE M.O.H.

The action of the medical officer of health on receipt of notifications, or on learning of suspected cases of poliomyelitis, should proceed on the following lines :—

(*a*) Assist in securing suitable accommodation, including isolation, for the patient in hospital or otherwise ;

(*b*) Ensure the precautions required in the light of the information that the disease is apparently capable of transmission by mild cases or even by the apparently healthy ; and

(*c*) Make investigation of the associated circumstances, including a search for missed cases.

In epidemic periods local authorities should endeavour to inform the public, by means of leaflets, posters, notices in the press, cinema films (preferably shown in the open), lectures in the schools, &c., how infection may be guarded against and of the care to be observed in case of attack. Public information should also be circulated respecting the arrangements and facilities for treating patients which are available in the district. All crowded assemblies should be discouraged, as far as possible, while an epidemic prevails, and all gatherings of young children should be avoided ; nor should young children be allowed to enter any house where there is a case of illness.

The medical officer should advise his council as to, firstly, what can be done to promote early diagnosis during the acute stage of poliomyelitis (e.g., specialist advice and facilities for examination of cerebrospinal fluid at practitioner's request), and secondly, what arrangements can be made under the local orthopædic scheme for medical practitioners to send all children affected, whether the condition is slight or serious, to an institution equipped to give such special treatment as may be required to prevent avoidable muscular weakness or permanent deformity.

In view of the high proportion of cases of poliomyelitis which occur below the age of five years, and bearing in mind the good results of effective treatment and the serious consequences of neglect, it is important to take such steps as may be possible to secure orthopædic treatment for young children in connexion with the child welfare services. Health visiting and the orthopædic clinic are valuable means by which cases of paralysis are discovered and referred for treatment. All notified cases should be followed up throughout the whole period of their illness to ensure that their treatment is suitable and continuous.

Immunisation

The administration by the subcutaneous, intravenous, or intrathecal method of serum obtained from a patient who has formerly had poliomyelitis (so called "convalescent serum") was advocated by Netter in 1911 in the preparalytic stage with a view to preventing the onset of paralysis. Between 1925 and 1931 Macnamara and Morgan[5] treated 133 persons in the preparalytic stage in outbreaks in Australia with "excellent" results, but admittedly without adequate controls. American evidence states "the results of the study are inconclusive" (New York Academy of Medicine, October, 1932).

The Victoria report (1937) notes that attempts at conferring passive immunity by injections of human blood-serum proved ineffective in practice.[3] It is

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clear, therefore, that much more experience of this remedy is necessary before its value in preventing the onset of paralysis in poliomyelitis can be appraised. The same caution applies to normal sera obtained from human beings or from artificially immunised animals. The use of both of these has been suggested because they have been found to contain relatively large amounts of the specific antibody. At the same time it is fitting that the subject should be kept under review. In an article by Eagles, Jensen, and Henningsen (1937) [6] emphasis is laid on the importance of a common standard for expressing the potency of anti-poliomyelitis convalescent serum. The authors investigated a large number of convalescent sera during the extensive epidemic of poliomyelitis in Denmark in 1934, and showed by means of serum-neutralisation experiments on monkeys that it is possible to collect pooled convalescent sera with a neutralising value as great as that possessed by hyper-immune horse serum.

On the other hand, the important experimental work of Hurst and Fairbrother [7] would suggest that the virus of poliomyelitis is a true neurotrope, that is, it exists and produces its characteristic effect only in association with nerve-cells. Prof. Schultz of Stanford University, California, holds that immunity in poliomyelitis is cellular not humoral, the resistance to attack being a function of the nerve-cell and not of substances in the blood stream. He therefore considers the virus to be within the central nervous system and essentially out of reach of circulating antibodies. Brodie and Park (U.S.A.) have come to a similar conclusion.[8]

Several forms of poliomyelitis vaccine have been on trial. A living attenuated virus has been used as well as dead viruses. At the annual meeting of the American Public Health Association held in October, 1935, a certain formolised vaccine was regarded as innocuous, though not necessarily efficacious. Doubt was, however, expressed whether the administration of a living attenuated vaccine which in a few cases has been followed by the appearance of paralytic poliomyelitis was desirable in the present state of knowledge. Dr. J. P. Leake, medical director of the United States public health service, has supplied additional evidence which supports this grave warning.[9] In the Victorian report it is stated that attempts at conferring immunity by vaccines prepared from detoxicated virus proved as ineffective as the serum results.

Respirators

As is well known, in certain acute types of poliomyelitis the paralysis takes an ascending form beginning in the legs, rapidly extending to the trunk and arms, and finally involving the muscles of respiration. To maintain life in such cases artificial respiration is essential and in modern times this is provided by placing the patient in some form of mechanical respirator, of which the Drinker apparatus is perhaps the best known. It is desirable and important that the leading central general hospitals throughout the country should be provided with such an apparatus and that in the event of an epidemic medical practitioners should be informed of its situation.

These respirators proved of value in the Victorian epidemic. The report states :—

"When the epidemic started, only two respirators were installed in Melbourne hospitals. The need for more respirators was soon evident, and Prof. A. F. Burstall, professor of engineering in the Melbourne University, did magnificent public service when he designed a type of respirator which could be made locally. The manufacture and installation of these respirators in hospitals throughout this State was a notable feature in the history of this epidemic." [8]

The practical value of the respirator appears to be limited to cases with temporary peripheral paralysis of the intercostal muscles and diaphragm. Such fleeting palsies are common in epidemic outbreaks of poliomyelitis and without the artificial aid to tide over the period of danger are usually fatal. The apparatus should be used as soon as symptoms of respiratory distress arise, and be used continuously until recovery, or until the residual paralysis has become stationary and the patient has adjusted his respiration to the muscular power remaining with him. For respiratory failure of bulbar origin the apparatus was found to be useless.

Conclusion

Much knowledge concerning the clinical manifestations, pathology, and epidemiology of poliomyelitis has been acquired within a comparatively short period of time. Infection is disseminated, in the first place, like other infectious diseases by case-to-case contact. Fortunately, however, the links in the chain of infection are broken, firstly, by the fact that the causal virus dies out quickly and has a brief existence outside the body; secondly, because many temporary carriers of infection do not contract the disease owing to lack of that mysterious catalytic agent of infection which is termed susceptibility.

At present the results of prophylactic treatment by convalescent serum are held to be inconclusive, and no protective vaccine which receives general acceptance has been devised. For the control of the disease reliance has to be placed on general administrative measures and the full coöperation of medical practitioners and the public with the health authorities in them. Of these measures of control accurate notification, the recognition of mild and abortive cases of the disease, skilled medical and nursing care, hospital provision, isolation of the patient at home or in hospital, isolation of child contacts, and specialised orthopædic advice and treatment together with after-care may be regarded as the more important. Important too is the abstention from crowded gatherings and places of amusement during epidemic prevalence. Measures of this kind have undoubtedly proved valuable in dealing with British epidemics. Recently, the tragic epidemic in Australia has seen the application of similar measures on a much more extensive scale. It is encouraging to note that the authors of the Victorian report believe with reason that the work of health officials in this way did lessen the incidence of the disease and materially slowed down the course of the epidemic.

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SPECIAL ARTICLES

PANIC AND AIR-RAID PRECAUTIONS

NOTES FOR DISCUSSION

Prepared by JOHN RICKMAN, M.D.

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SINCE air raids may produce panic in the civilian population it is well to consider the factors that facilitate or diminish panic, and what steps, if any, may be taken against it. First let me quote definitions of relevant words.

"Fright, fear, apprehension are incorrectly used as synonymous expressions: in their relations to danger they admit of quite clear distinction. *Fear* requires a definite object of which one is afraid; *fright* is the name of a condition to which one is reduced if one encounters a danger without being prepared for it; it lays stress on the element of surprise." [1(e)]

"*Anxiety* has an unmistakable affinity with expectation: it is anxiety about something. It has a quality of indefiniteness and lack of object. In precise speech we use the word 'fear' rather than 'anxiety' if the feeling has found an object." [1(f)]

Anxiety can be a more or less normal phenomenon or it may be neurotic. "Objective danger is a danger that is known, and objective anxiety is an anxiety about a known danger of this sort. Neurotic anxiety is anxiety about an unknown danger. Neurotic danger is thus a danger that has still to be discovered." [1(g)]

"There are two reactions to objective danger. One, an affective reaction, is an outbreak of anxiety [or fear]. The other is a protective action . . . the two reactions can co-operate in an expedient way, the one giving the signal for the other to appear. But they can also behave in an inexpedient way: paralysis due to anxiety may set in, and the reaction spread at the cost of the other. In some cases the characteristics of objective anxiety and neurotic anxiety are mingled. The danger is known and objective, but the anxiety in regard to it is over-great, greater than seems proper." [1(f)]

The foregoing definitions are clear and would be generally acceptable. In regard to *panic* there is less agreement. The word is popularly used in three ways:

(*a*) To denote a dread not warranted by the occasion. This is covered by "neurotic anxiety." (*b*) Where dread exceeds certain bounds. This places the accent only on quantity and does not take into account the special characteristics of panic—viz., its relation to other people and its "nameless horror." (*c*) For any *collective* dread. This emphasises the social bond but it ignores the fact that in panic the social bond is broken.

These three between them contain several essential features of panic, but they do not go far enough: they ignore the loss of self-control.

CAUSATION OF PANIC

Ætiological factors have been divided into four classes [1(a)]: (*a*) predisposition, (*b*) specific, (*c*) contributory causes, and (*d*) exciting or releasing cause. Without the predisposition and the specific causes the effect—i.e., panic—could not come about; contributory causes need not be present every time there is panic and cannot by themselves produce it.

This formula helps to clarify the issues, for since panic occurs (though infrequently) apart from external dangers and may occur when the external dangers are diminishing, we cannot regard external danger as "the" cause of panic; though of course external dangers contribute very much indeed to the release of panic just as bad housing or malnutrition contribute to the onset of tuberculosis. In both disorders resistance is very important.

The predisposition and specific cause in panic is not clear; it may have something to do with a tendency to nervous breakdown, which under normal conditions is not apparent. External danger mobilises aggressive impulses. If there is no opportunity for immediate outlet the executive part of the mind in dealing with the increased mental tension is forced to effect a redistribution of love and hate impulses. It may be that an incapacity to effect such a redistribution rapidly enough is the predisposing cause of panic. A direct attack on the panic problem by "getting at the roots"—i.e., altering predisposition and specific cause—is very probably not possible, at least as regards the community as a whole; but this should not deter anyone from attempting to grapple with the contributory factors, difficult as this may be.

PANIC IN AN ORGANISED GROUP [1(g)2]

In an organised artificial group, such as an army, the outbreak of panic, or its absence, does not depend on the amount of objective danger; of more importance is the lowering of the resistance to dread.

In an army in panic orders are not obeyed; the mutual reliance on authority is lost and the members of the group act as individuals—i.e., the group tie holding them together (sharing the submission to the officers and the solidarity that comes from sharing an ideal) is lost. "Each for all" gives place to "each for himself."

The ties that bind a member of the group to other members also serve to keep in check the unrestricted expression of the individual's emotional reactions; loyalty to the group facilitates self-control. Some of the self-esteem that is lost by submission to the group leader, or by the acceptance of the group ideal, is compensated for, while the group tie is strong, by the good regard or moral support of the group. When the group ties are broken few individuals can in the face of danger readjust themselves quickly enough to the sudden demand for *self*-reliance (before, there had been reliance on the group); and, having no support either within or without, they are the victims of the "nameless horror." Panic when it comes is always a surprise, the unexpectedness arising not from a new external situation (the degree of danger may not have changed) but from a revelation of internal confusion or lack of control.

Members of an organised group turn some of their affection towards other members of the same group, but their hostility is in the main turned outwards; the cohesion of the group is thus maintained by the maintenance of bonds of affection and hate—safely distributed. When group cohesion vanishes some of the affectionate ties have lost their object—i.e., are now available for persons outside the group—and the forces of hostility, heretofore mainly directed outwards, are now detached from their object and may turn inwards towards members of the same group. A part of the "nameless horror" is due to the turning back of outwardly projected (and therefore formerly "safe") hate upon persons who had stood near to the self in time of danger and were loved and trusted. Thus the breakdown of the group system has personal as well as social consequences;

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hate is once more dangerous and its exercise, even in thought and intention, is felt to jeopardise persons who have not merited such hostility. In panic, to the mental distress of anxiety is added that of guilt.

But the state of panic goes a step further and the subject feels that he is without friends at all, he can trust no one: he is alone, or at least friendless. Not really alone however, because the "shortening of the trajectory of hate" (no longer extending mainly outside the group) turns former friends into potential enemies, and his self-knowledge that panic increases his own egoism tells him that others are now less willing to bear him goodwill. Therefore another source of the "nameless horror" is not mere loneliness but the suspicion that one is surrounded by potential enemies.

Yet another source of the mental anguish of panic is the realisation that one is helpless to defend those one loves. Not only are the group ties broken, but the capacity to do any constructive action in the face of danger is lost. The loss of inner resources against disaster renders one powerless to stop destruction, and there is a tendency under these conditions to join with the enemy and start destroying what lies nearest, which is usually also dearest. This perhaps is the greatest reason for the dread of panic; the victims realise or are dimly aware that it is a condition in which values disappear and all the evil in themselves may be loosed on what is good about them.

PANIC IN AN UNORGANISED GROUP

It is a mistake to think of panic as a sudden state of collapse from a previous condition of perfect self-control. It is in the extreme case a condition of uncoördinated impulses to action and unpremeditated actions, but there are intermediate stages in which some degree of response to group feeling remains and the ties of affection and duty still control behaviour.

The main difference between panic in an organised and an unorganised group lies in the greater resistance to panic in the organised and in the greater difficulty in re-forming emotional ties in the unorganised group. The organised groups—e.g., army, church, boy scouts, women's institutes—are usually also more or less homogeneous and with a leader; the unorganised groups—e.g., family, township—have no visible structure; they are united by various ideals and interests (sometimes in conflict) and the emotional ties that bind them are often weak. Their resistance to panic is therefore not so easy to strengthen by prearranged plan.

Since there is a tendency to the spontaneous formation of groups it is desirable that schemes (if and when devised) should not attempt to institute new and artificial groups unless it is beyond doubt that these will be effective.

In the preliminary stage of panic there is a tendency for the larger group loyalty to be abandoned in favour of smaller group formations. When this occurs those whose position in the administration leads them to think that they govern the people may regard the situation as out of hand, or even hopeless; whereas in fact it is a redistribution of group loyalty to meet mental strain. The situation only becomes dangerous when the smaller groups develop hostility to one another or to the central authority. (As a measure to reduce the risk of this the provision of many food depôts seems desirable; the fear of starvation—a dread from which no man is exempt in time of danger—is closer to consciousness than civilised man commonly realises.)

A sign that the anger of the population is finding outlet against a *common* foe is that of increased volunteering for national service. There is reason to think that the voluntary system, as distinct from conscription, acts as a conduit for the discharge of pent-up anger in the small groups from which the volunteer comes—i.e., the volunteer is the proxy in aggression for his group. Anti-panic schemes could utilise this mental mechanism but should weigh the risks of concentrating too much loyalty on the central authority (cf. totalitarian countries).*

GROUP BONDS AND SELF-CONTROL

Group ties are an acquisition, not an inheritance; they develop in infancy during the period of great dependence and are influenced by the child's need for help from its parents in obtaining control over its own impulses. Thus conscience is partly acquired from the environment and is developed for dealing with the instinctual part of the personality.

Group bonds and self-control are closely connected at the beginning of mental life, and in adult life in time of danger the close connexion is once more apparent. The early attitude to the parental authority is in later life displaced onto the Government (nation) or the G.O.C. (army), Pope (Church), &c., and these must fulfil in some measure the ideals attributed, in the unconscious, to good parent figures; these must (i) *govern*—i.e., keep order and dispense justice fairly—and (ii) *protect*—i.e., supply needs and distribute them fairly, giving equal opportunity to each member of the group.[1(d)] When these conditions are fulfilled the authority of the group is accepted as a good parent figure (in the unconscious); the members unite in respect for their authority and their friendly relation to one another is facilitated.

A group tie based on this equal treatment facilitates self-control. Envy (the wrecker of nurseries) if not mitigated even in later life by fair play leads to increase of hatred, which induces mutual distrust (the wrecker of societies). That is to say, self-control is easiest when there is no sense of injustice.

Self-control is aided in large measure by the "ego ideal"; the power of parental injunction and that of other superiors being vested in this controlling force.[1(b) 1(c)] There is both a "regulator" of conduct and a source of "inner support" in this internal mental factor, which from the first is closely related to social life.

One of the functions of the Authority is to *protect*. This concept must not be treated narrowly in a military or economic sense, but rather in the psychological sense. Physical danger and severe threat to economic security do not in themselves produce panic, provided that the individual has an "inner support" (self-confidence); but these factors may endanger the inner support by activating unconscious impulses which have to be kept in check—i.e., they increase the "internal dangers."

EXTERNAL AND "INTERNAL" DANGERS †

Air raids are likely to produce mental strain, arising from two sources—external danger and "internal danger."

Strain arising from External Danger.—The emotional response (fear) produced by an external danger is normally a signal to the mind to *do* something to remove the source of danger, and if the appropriate action is not adequate or is impossible, the emotional strain inevitably increases. It seems therefore, since

* A discussion of the democratic technique for dealing with discontent is to be found in the first leader of THE LANCET of Nov. 16th, 1935.

† The clearest account in non-technical language of "Internal Dangers" and the way in which they are overcome is given in "Love, Hate and Reparation" by Melaine Klein and Joan Riviere. London. 1937.

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the civilian population cannot reach the source of danger and stifle it, that an increase of affect without adequate discharge is inevitable. This however is not the same as saying that there are no measures that can be taken to support the ego, or executive part of the mind, during the time of stress.

Strain arising from "Internal Dangers."—The part of the mind in which the internal dangers operate is *unconscious*—i.e., not accessible to conscious introspection. The important elements operating in this unconscious part of the mind are infantile impulses, phantasies and anxieties, and the emotional relation to people arising out of these impulses. Phantasies of attacking and being attacked occur in every child, and these phantasies—and the impulses which give strength to them—persist in the unconscious of the adult. They are activated by any factor which puts an increased strain on the ego or conscious executive part of the mind. Normally much energy from these infantile phantasies is exploited (sublimated) in work and in social life in useful ways, but in crisis the energy may be withdrawn in greater or less degree from socially useful employment in the external life and be diverted back to the reactivation of these early phantasies. For instance to the *risk* in an air raid of physical injury to the self, there may be added in phantasy a *certainty* of the most painful mutilation; this is so because the unconscious takes no reckoning of probabilities but goes to extremes—"all or none." This phantasy may so far absorb mental energy as to paralyse a person from taking precautions against the risk. But the mind may react against the impending panic by another device, and, reverting to a belief in omnipotence (a characteristic of infantile modes of thought), it may deny that there is any danger (omnipotence of the self), or may assert that the government (parental authority) is omnipotent and gives full protection; thus it may put implicit trust in everything the Government says, or even read into official statements ideas which the Administration does not hold. Such statements as the "100 per cent. efficiency of the gas-mask" are stretched to cover *all* kinds of gas-risk; balloon barrages and anti-aircraft defences are thought of as conferring immunity from attack, and so on. This attitude leads to omission to take proper precautions.

The stability of a mind which adopts *denial* of danger as its mode of defence against panic is liable to suffer sudden collapse and then it is too late to set in train the "manipulative activities"—i.e., doing something useful for the self and for others in an orderly way—which tend to strengthen the ego against panic.

The gravest of the internal dangers however arise from the mobilisation of aggressive phantasies directed against loved persons, through identification of the self with the enemy. The person thus feels himself to be in his heart an enemy to his "loved objects" and has to stifle a conflict within himself before he can face his own conscience within or the enemy without. It is not certain but it is in my view probable that this is the principal factor in loss of ego control when faced with dangers of the kind we are considering and therefore in the incidence of panic. The central point of this concept turns on the term "loved objects." This must not be taken narrowly as meaning only persons with whom one is in love, nor confined to present-day persons (here the peculiar "timelessness" of unconscious mental processes comes into prominence); it must rather be regarded as a relation of love and affection to all objects that are or have been endowed in the mind with the attribute of "goodness" (of being helpful, supporting, kind, love-worthy—objects to which one feels drawn). The term also includes ideals, causes, and beliefs which are felt to be nearly as precious as life itself. Because these impulses and phantasies and the objects to which they relate are unconscious it is impossible to predict the incidence of panic, and for the same reason it is impossible to take direct precautions against its outbreak. Inner dangers cannot be removed with certainty except by means which get into the inside so to speak; but once again this is not the same as saying that all measures against panic are useless. The internal dangers which we have all struggled with as children—and in lesser degree still struggle against—we have in the past for ordinary situations largely overcome: in extraordinary situations, such as air raids, it is reasonable to adopt so far as possible the same measures which earlier have proved more or less effective.

As objective experiences, air raids may be to most of the population new; but the essential elements—attack from an invisible foe, explosions, and poisonous gases and incendiarism—are so much in line with unconscious infantile phantasy that it is not expedient to regard air raids as new experiences subjectively. There is even something encouraging in this, for what once succeeded in allaying mental strain may be used to that end again. If we think of external dangers only, we can see no rational remedy; but if we consider also "internal dangers" we are not utterly without hope.

PSYCHOLOGICAL PRECAUTIONS

The essential causal factors of panic cannot be altered by any one measure, but attention to the contributory factors may lessen its incidence. Panic is not a new experience for any of us, but a veil of amnesia covers our most important experiences of it.

Four main factors increase mental strain: isolation from the group; absence of means of removing the source of danger or rendering it less harmful; unreliability of belief in Omnipotence; and distrust of Authority. In infancy these factors made mental strain worse and led under certain conditions to panic, which was then overcome by formation of groups, by mastery of the sources of danger (external and internal), by increased reliance on objective experience and diminished reliance on magical beliefs, and by coming to terms with Authority.

Membership in a Group usually reduces dread. Opportunity for friendly interchange and for a mutual "hate" against the enemy keeps away the feeling of complete isolation—which often rapidly passes over to feelings of worthlessness—and acts as a support for the ego. So far a truism; but the psychological consequence of this is not quite so obvious. The mere huddling together of people, even when they have occasion for a mutual "hate," does not constitute the most efficient group-psychology defence against panic. A group cannot be welded effectively by hate.

Panic is probably best allayed by doing something for those one loves. This is presumably the basis of the A.R.P. advice that people should stay in their homes and make them gas-tight, each person being given a duty. The group here is a "natural" one, that of the family; but this assumes that the family ties are good to begin with and will not be made worse by the strain of a raid. The stay-at-home policy (for which one could devise a slogan "Do not go out to seek safety. Make it—at home!") does not however take into account the degree of aptitude

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for, and satisfaction from, manipulative activity (this varies greatly); it omits consideration of the mental state of persons with a claustrophobic tendency (the number of whom is many times greater than of those with manifest claustrophobia), and above all it does not take into consideration the fact that many find their group feelings roused more deeply and more readily in the company of their own sex, or in a society based on community of work or social interests.

The chief objection to the stay-at-home policy (apart from the fact that of the three dangers—high-explosive, incendiary, and gas bomb—at best it may afford some protection only from the last) is that the Government does not appear in this policy as an active partner. A great wave of hate and distrust will come if it fails, and as air raids are likely to be repeated this is a thing no government could or should risk. In time of danger, a government cannot rely on working up a spirit of loyalty if in the preceding months it has not won the respect of the public by showing an energetic and realistic endeavour to protect and a fairness in the distribution of the protection.

Such measures as evacuation of a part of the population, and the organisation of groups of householders into units for A.R.P. work, can be considered as regards the type of group formed and its effect on increasing resistance to panic. A group may be given a leader by the central authority but may nevertheless be leaderless from a psychological point of view. Though given a structure or hierarchy, in a moment of crisis the group may still behave in an unorganised way. A paper organisation which breaks down might be worse than none at all. Since the English are not particularly docile and still think of their home as their castle, the home-staying policy may be the best we can organise en masse, unless we are willing to spend much money and effort on very numerous, very well-protected shelters.

Mastery of the Sources of Danger.—As we pass from infancy to childhood and to adolescence we grow less afraid; not because we grow strong in the control of external danger but because we grow less afraid of the sources of internal danger—our own aggressive impulses. In this process of mastering anxiety, doing things, particularly for others, plays a significant part. In time of crisis the more primitive mental reactions again become important, and the opportunity to be vigilant on behalf of others and to get busy oneself strengthens the mind to resist panic. Therefore A.R.P. instructions which lay stress on active measures of preparation will tend to reduce panic. The mastery of the Sources of Danger should not, therefore, be considered solely in terms of dowsing incendiary bombs or shooting down bombers, but as covering all measures which give self-confidence and divert attention *outwards*. The allotting of duties within the shelter (of whatever kind it be) sets the mind going in an active and constructive direction and so lessens the risk of uncontrollable dread; even if the chance of doing anything "100 per cent. effective" is small, nevertheless the doing something in the right direction tends to diminish the strain of mind which comes from a purely passive resistance to apprehension.

Diminished Reliance on Magical Beliefs.—In time of mental stress the mind often tends to rely on magical beliefs. Danger lies here in two directions: first, the magical remedy against danger may be suddenly doubted—i.e., the resistance to panic may suddenly collapse; secondly, the reliance on a talisman, if this is provided by an Authority, may lower the capacity for group activity or the full utilisation of group bonds.‡

"I, in my mask, am secure: the devil take the hindermost!" is more likely to be adopted as a way of thought if the gas-mask is declared to be "100 per cent. efficient"—i.e., is claimed to be perfect. 100 per cent. efficiency is not in any case probable; it requires an effort of mind to contemplate it rationally, but many will jump at the idea as a consolation. Is that consolation to be denied to these nervous people? The question is not well put: it is rather "What measures will best meet the craving for security in a situation of great insecurity?" No one would stop a man practising his private magic; if he needs it he will make a talisman of his own; but the question is, what is best for the Government, public authorities, and scientists to do when faced with a demand for what in fact is magic? If there was likely to be only one occasion of panic the Government intent on prosecuting the war could afford to take the risk (even in democratic England) of adopting the attitude of omnipotence and omniscience by saying, "Obey me and you will be safe!" But air raids may be repeated, and therefore from a military point of view the Government would be unwise to lend too much of its prestige to magic; for magic is an unstable ally. Just as those in need of talismans (and other objects of private protective ritual, such as a horse-hair tied round the finger) will make them for themselves, so those in need of the belief in an omnipotent governmental authority (parent figure in the unconscious mind) will in time of crisis exalt the Government to a position of a Protective Deity, and nothing can stop them from doing so. But it is wiser to encourage reliance on appropriate action rather than on consoling beliefs. In my opinion therefore the Government should give a lead in rationality; for example not saying "gas-masks are 100 per cent. efficient," which no reasonable man will believe, but that they give protection for so many hours in the concentration of such and such likely to be met in the case of the probable gases in an air raid; and stating the probable proportionate risks of high-explosive, incendiary, and gas bomb. The public in fact should be instructed to think in terms of relative quantity, of more-or-less (reason, conscious mental action) rather than of all-or-none (blind belief, unconscious mental action). It is no valid argument that the public wants plain statements and that therefore the niceties of relative quantities are likely to lead to mere confusion of mind. The risk we are considering, and which has to be combated, is a state in which confusion of mind is completely dominant, and the aim must be to strengthen the controlling forces in the mind. These find support in action—mental action no less than physical. The publication of simple but accurate statements of the various risks, of detailed reports on the effects of aerial bombardment in Spain and other areas of modern warfare, and of the ways in which risks have been effectively dealt with, so far as these are known, therefore seems desirable as an Air-Raid Precaution.

Besides giving a lead in protection from an external danger another way of assisting in panic-prevention is open to the Government. It can contribute to the sense of security by providing a quite different kind of "internal support" from that we have been considering, but one of great psychological importance

‡ The medical man may be asked by his patients for advice about analgesic drugs in case of injury. The giving of such drugs may be attended by psychological risks in unstable persons and the matter should be considered with an eye to mental as well as physical effects.

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—namely, food. The confidence that even though the physical structure of civilisation (railways, &c.) may be badly smashed up, this essential support will be distributed regularly to each individual and fairly as between the various classes in the community, will go far to create a solid group spirit and a good relation to the Government.

The Relation to Authority.—Mention has been made of the danger of blind submission to Authority; but in time of crisis complete emotional independence from Authority is for most people neither possible nor desirable: there is need for leadership and a desire (not necessarily prominent in consciousness) for guidance in action. This favours the quick and loyal submission of the individual to the Group or Commanding Officer and two things are required—a leader who will really lead, dealing fairly between all members of his group, and a group with which the individual can readily identify himself. These are the factors required to bring stability to an unorganised group and so to reduce the risk of panic. Training in submission to orders is an advantage to rapid group-formation, and such activities as fire-drill practice, "physical jerks," boy-scout and girl-guide work, and military drill all work to this end.

* * *

There are probably no really effective specific remedies. Two which have been given much consideration as a recipe against fear may be mentioned: Totalitarianism (even if acceptable in this country) is a brittle crutch; and Religion is apparently easier to prescribe than to dispense.

In conclusion and to repeat: panic in the adult is not a new experience; it is a recrudescence of an earlier state which is screened from us. This gives some of the nameless horror to panic, but it also gives a key to reducing its incidence. Unable to attack its specific causes we can endeavour to reduce the contributory causes, and can follow the ways taken to overcome the periods of panic when our minds were immature: by formation of groups, by manipulative activities, by turning slowly from blind and magical beliefs to a more reasoned interest in the world around us, but above all by acquiring the capacity to recognise and control our own egoism and impulses of hate. On this last depends the success of group-formation and group activities which always exercise a large influence in checking the outbreak of panic.

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PARIS

(FROM OUR OWN CORRESPONDENT)

GONORRHŒA AND THE FRENCH BIRTH-RATE

THE many discussions within the Academy of Medicine on the subject of the low French birth-rate have brought to the surface a strange assortment of things, from statistics about gonorrhœa to quotations. The most dramatic of the latter hails from Georges Clemenceau at the time of the ratification of the Treaty of Versailles. This distinguished, in a political sense, member of the Academy of Medicine said that if France dispensed with large families, all the safeguarding clauses of the Treaty, and all the cannons taken from Germany, would not save her from annihilation. As for the disconcerting reality that the death-rate has been higher than the birth-rate during the last three years, opinions seem to have varied with regard to the relative importance of the causes of the decline of the latter. Dr. Marfan would have it that the causes were so largely non-medical that the Academy of Medicine was impertinent, in Parliamentary jargon, in attempting to tackle this problem; and he felt so strongly in this sense that he was not prepared to give his vote in support of the conclusions formulated by the Academy's commission on denatality. On the other hand, Dr. Béclère found one key, if not *the* key, to the problem in the obscure gonococcus whose activities have recently been much illuminated by the hystero-salpingographic studies of Claude Béclère and Elie François in the hospital service of Prof. Couvelaire. They have shown that nearly three-quarters of the women coming to this service on account of sterility suffered from changes in the Fallopian tubes betrayed by no clinical signs. Sometimes the obstruction of these tubes was complete, and this was so in half the cases, whereas in a quarter the obstruction was only partial. The evidence was clearly indicative of infections contracted during sexual intercourse, the Fallopian tubes becoming infected and obstructed early in marriage or as a sequel to an abortion or confinement at term. Béclère's remedies for this state of affairs included as a matter of routine a very careful prenuptial medical examination which might lead to the discovery and cure of lingering foci of gonorrhœa in the male urogenital tract.

HUMAN VIVISECTION AND THE LAW

The other day a middle-aged gentleman, hitherto at large, was urgently invited to enjoy the hospitality of the French Republic for a generously long period. Not liking this hospitality he offered his body to anyone willing to experiment on it, even to the point of inoculating it with the germ of cancer. But no one has yet come forward to claim the body.

What of the legal implications of such an offer? Could it have been accepted without legal risks to both vivisector and vivisectee? The well-known French medico-legal expert, Dr. Paul Boudin, answers this question in the negative. It needs, of course, no great legal perspicacity to understand that what begins as vivisection might merge imperceptibly into a post-mortem examination. But even if the vivisector failed to kill, and only injured the subject of his experiments, the latter might yet sue the former for damages and would, in Dr. Boudin's opinion, be successful in his suit. The defendant would be held up to obloquy as one who, knowing full well what might befall his victim, had exploited his ignorance and generosity to further his own ends, such as personal ambition. Even if the vivisectee could not or did not bring the case to court the Republic itself might step in and hold the vivisector responsible for the unhappy consequences of his vivisection. The outlook would then be quite sombre for the vivisector, however many affidavits he might hold, duly sworn to and signed by his victim. For the Republic would insist that this act had been contrary to law and order and to public morals.

THE FRENCH CANCER LEAGUE

On May 17th the *Ligue française contre le cancer* celebrated its twentieth anniversary at a meeting attended by many eminent persons and presided over by Monsieur Justin Godart, former Minister of Public Health. In a survey of cancer research in general and of the League's activities in particular,

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Dr. Antoine Béclère showed how enormous have been the advances made during the past century with regard to a disease hitherto considered with hopeless pessimism. From being an inevitably fatal disease, cancer has become an eminently curable one, provided certain elementary conditions are fulfilled. In the course of its activities, the League has compiled more than 30,000 personal records, some of which cover half a score of years of observation since the patient was cured by some treatment or other. The staff of the League paid some 300 visits in 1937, collecting information and bringing relief and advice to the patients visited. The League publishes a quarterly bulletin, pamphlets, and posters, organises lectures, helps to finance research workers, and contributes to the campaign against cancer in various other ways. It is hoped that the holding of a cancer week and the sale of a special stamp in November of this year will help to ease the League's war chest whose contents have been somewhat depleted by the recent general financial stringency.

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

AUTONOMIC REFLEXES

THE Morison lectures were given last week at the Royal College of Physicians of Edinburgh by Dr. E. Arnold Carmichael, director of the neurological research unit at the National Hospital, Queen-square. His subject was the study of reflex activity of the human autonomic nervous system, and he began by speaking of the various methods of investigating the activity of this system. He referred particularly to the work of Sir Thomas Lewis and showed how the local skin reactions that Lewis described are dependent on axonic responses. He then turned to the intricate methods that he and others have evolved for investigating the central reflex activity of the autonomic nerves. He has used very delicate methods of recording the volume and the temperature of the digits and his usual method is to make a record simultaneously from one digit in each of the four limbs. These methods are so sensitive that a slight stimulus such as taking a deep breath or the application of a piece of ice to the forehead at once leads to a fall in the record of the volume of the digit, indicating vasoconstriction. Exposure of one limb to heat also produces a rapid rise in the temperature of the other limbs before the rectal temperature is altered; indeed the peripheral vascular dilatation may actually cause a fall of rectal temperature. From his experiments Dr. Carmichael has proved that these reflexes are central. They may to some extent occur at the level of the spinal cord, and the reflex contraction of the peripheral arteries following a deep breath probably occurs through the medulla; but there is evidence to show that an important, and perhaps the most important, centre for reflex vasomotor control is situated in the hypothalamus. In his studies of brain disease Dr. Carmichael was unable to find any evidence that lesions of the cerebral cortex interfere with the reflex activity of the autonomic nervous system.

TYPHOID IN HAWICK

The outbreak of enteric in Hawick is now subsiding. The number of cases admitted to hospital during the week ending April 30th was 7; in the week ending May 7th it was 34; in the week ending May 14th it was 52, while in the following week it was 17. Very extensive investigations have been made in an attempt to determine the cause of the epidemic, and it is reported that a carrier has been found who is an employee in a coöperative store. This carrier, it is said, had been handling two or three different types of foodstuff which had been used by every case that has so far been traced. There has not at any time been any indication that the water-supply is contaminated.

PHYSICAL WELFARE OF EDINBURGH STUDENTS

I have previously referred to the munificent gifts and schemes of Dr. J. D. Pollock for the benefit of Edinburgh University and especially of its students. While these schemes have not yet been worked out in full detail there is no doubt that extensive plans are being made by the university authorities for the physical education of the students. It is proposed to spend about £20,000 on accommodation for this purpose, half of which it is hoped will be provided from the University Grants Committee. The purpose of the schemes will be to improve the physical and social well-being of the student-body, and to this end the students themselves will coöperate with the university authorities. Thanks to Dr. Pollock's benefactions these developments will place no new burden on the existing revenue of Edinburgh University.

IRELAND

(FROM OUR OWN CORRESPONDENT)

THE HOSPITALS SWEEPSTAKES

THE draw for prizes in the Hospitals Sweepstake in the Derby was held last week. The total receipts were a little lower than those of the sweepstake on the Derby of 1937, but higher than in 1936 or 1935. The amount accruing to the funds of the hospitals will be approximately £437,500. The total amount collected for the hospitals in the twenty-four sweepstakes that have now been held is over twelve and a half million pounds, and of this sum £5,345,113 has been distributed, the remainder lying in the hands of the National Hospital Trustees. The plans for hospital development in Dublin, recently approved by the Minister, will make many calls on this residue, but there appears to be no reason to anticipate that money will be lacking for this purpose, or for the carrying-out of whatever further schemes may be required to complete the hospitalisation of the country. Among the minor purposes for which sweepstakes monies have been made available in recent years are the establishment of a Medical Research Council with a reasonable amount of funds at its disposal and the establishment of a Hospital Library Council empowered to give or lend books to hospitals. Both schemes are working satisfactorily

THE LANCET 100 YEARS AGO

June 2nd, 1838, *p.* 332.

From a discourse on diagnosis, by Dr. William Macdonald of Greenock.

. . . The student of medicine should not forget that differences of opinion exist in relation to almost every subject of research, and that no authority for learning will furnish a sufficient security from error; all opinions, therefore, and more particularly all medical opinions, may be warrantably questioned, and none are to be received unless the arguments adduced to support them be found solid and convincing.

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GENERAL MEDICAL COUNCIL

SUMMER SESSION, MAY 24TH–28TH, 1938

(*Concluded from p. 1244*)

Penal Cases Reported by the Dental Board

THREE cases were brought before the Council after hearing by the Dental Board with the recommendation that the name ought to be erased from the Dentists Register: (1) Thomas Gordon, registered as of 61, South Clerk-street, Edinburgh; (2) Richard John Atkinson Ainsley, registered as of 79, Duke-street, Leith; (3) William Welch, registered as of 159, Ashted-row, Birmingham. Each of these was registered under the Dentists Act, 1921, and each had been found by the board guilty, with reference to dental letters issued by approved societies, of attempting to obtain money for work which had not in fact been performed. None of the respondents appeared, and the President announced in each case that the Council had judged the respondent guilty of conduct infamous or disgraceful in a professional respect and directed the erasure of his name from the Dentists Register.

RESTORATION TO DENTISTS REGISTER

After consideration in camera the President announced that the names of Aaron Leslie Barnett and Robert Marley had been restored to the Register.

Charges against Medical Practitioners

DRUNKENNESS AND MOTORING OFFENCES

At the summer and winter sessions last year five doctors were found guilty of infamous conduct as a result of police-court convictions for drunkenness and motoring offences, and sentence was postponed until the present session to enable them to produce testimonials as to their conduct in the meantime. All these cases were reconsidered by the Council, together with the testimonials produced. In one case the respondent was not present but was represented by his solicitor who put in a medical certificate to account for his absence. In another case the respondent was neither present nor represented; he wrote that he could not afford to come to London and could not produce more testimonials; his case was further postponed for six months. In all the other cases the Council decided not to erase the name.

Eight new cases related to similar offences. In one the Council decided not to erase the name; in the others the charge was found proved and judgment postponed, subject to the production of the usual testimonials.

A BREACH OF TRUST

The Case of Robert Wilson Todd, registered as of Shotley House, Leven, Fife, M.B., Ch.B. 1922, U. Glasg., who had been summoned to appear before the Council on the following charge:—

That you were convicted at the Sheriff Court of Fife and Kinross at Cupar, on Feb. 1st, 1938, of the following offence—namely, of uttering as genuine medical cards each of which bore the name of the doctor to be signed as agreeing to the transfer to your list, each such signature being forged, and were fined £25.

Dr. Todd attended, and was accompanied by Mr. Oswald Hempson, solicitor, acting on behalf of the Medical and Dental Defence Union of Scotland. Mr. F. P. Winterbottom, solicitor to the Council, set forth the facts of the conviction, stating that the signature of the doctor had been forged on nine panel cards. There had been no canvassing; six of the patients had belonged to one family to whom respondent was family doctor. He had been almost bound to be discovered. The monetary gain could not have been more than fourteen shillings.

Dr. Todd, examined by Mr. Hempson, said he had purchased a practice of 700 panel patients in 1924 and had doubled the panel since then; he was married and had two young children. He had been very overworked during 1937 and had had a serious accident in March; his family, also, had all been ill. All the patients in question had required immediate treatment and wanted him to give it them. He recognised his fault, but had been moved by the distastefulness of sending a sick person to ask a former doctor for permission to transfer. No action had been taken by the Scottish insurance authorities.

In reply to the legal assessor, he said that there had been previous difficulty in getting consent to transfer in some cases; patients had complained.

In reply to Sir Kaye Le Fleming, he said he had believed that he was not entitled to treat a patient who was on some other doctor's panel.

Mr. Hempson put in statutory declarations from patients and testimonials, and stressed the case as one of folly rather than intentional wrongdoing. A local committee, wholly uninspired by respondent, had prepared for the Council a petition to which 2189 signatures had been obtained, all patients of respondent's.

The President said that the Council regarded Dr. Todd's action as a very serious breach of the trust imposed in doctors by Parliament, and did not consider that the circumstances constituted an excuse. Judgment, however, would be postponed for two years.

TWO CASES OF ALLEGED ADVERTISING

I

The Case of Henry Nunan Collier, registered as of 2, St. Peter's-close, Joiner's-lane, Chalfont St. Peter, Bucks, L.S.A. Lond., 1903, who had been summoned to appear before the Council on the following charge:—

That being a registered medical practitioner: (1) you are or have been associated with or employed by the Institute of Endocrinology, 1, Baker-street, London, W.1, which to your knowledge and with your sanction and acquiescence has sought to attract patients by systematically advertising in the public press, and in particular so sought by means of an advertisement published in the *Evening Standard* newspaper in August, 1937; (2) by means of the said advertisement you obtained Bryan Heber Percy as a patient; (3) by your presence, countenance, advice, assistance, or coöperation as an associate or employee of the said Institute, you knowingly enabled an unregistered person—namely, one Harpman—to attend, advise, and/or treat patients, and in particular to attend, advise, and/or treat the said Bryan Heber Percy, in respect of matters requiring professional discretion or skill. And that in relation to the facts so alleged you have been guilty of infamous conduct in a professional respect.

The complainants were the London and Counties Medical Protection Society.

Dr. Collier was represented by Lord Reading, K.C., and Mr. Salter Nichols, counsel, instructed by Messrs. Samuels, solicitors. The complainants were represented by Mr. W. A. Macfarlane, counsel, instructed by Messrs. Le Brasseur and Oakley.

Mr. Macfarlane said there was no dispute as to the essential facts. In his first reply respondent had said he wished his name removed, as he did not consider he was doing anything against the honour of the profession. There was no denial that the Institute advertised, though it was true that respondent's name had not been used in any advertising scheme. The Institute was run by a manager named Harpman,

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said to be assisted by a staff of English qualified doctors and nurses. Mr. Macfarlane put in a number of the advertisements from the *Evening Standard* of July and August, 1937, and February and March, 1938. Mr. Percy had seen that of August 9th, 1937. It read: "If your glands functioned normally, you would not suffer from . . ." (a long list of ailments). "Therefore consult the medical staff of our Institute and they will, after thorough examination, make a diagnosis and inform you what is the cause of your complaint." The advertisement added that treatment could be obtained in any town in Great Britain; another entry stated that 1860 patients had been treated during the past year. Mr. Percy, who suffered from dyspepsia, had called at the Institute and been given a pamphlet, which repeated the terms of the advertisement. He was then taken in to see Mr. Harpman, who asked questions as to his circumstances and symptoms and recommended a thirty-guinea treatment. Mr. Percy had paid half on account, and been taken to another room where two men in white coats examined him and took specimens from him; one of these was respondent, who had written, on the notepaper of the Institute, asking a nurse to give Mr. Percy a series of injections. Apart altogether from the advertising element Mr. Macfarlane submitted that the conduct of the Institute was open to many objections: the claims made were far too high; the pamphlet stated that treatment could be given anywhere; if the injections could not possibly do harm, it was a fair inference that they could not do good. Either they were harmless and ineffective, in which case it was obtaining money on false pretences; or they were potentially dangerous, in which case they ought not to have been sent to distant towns for administration by a nurse.

Mr. Heber Percy said that he had suffered from dyspepsia and had not had a family doctor. He described his visit to the Institute. He did not remember whether the nurse-receptionist had said "Mr." or "Dr." Harpman would see him. Mr. Harpman had elicited the medical history, and weighed him, commenting that the weight was too low. He had said that the trouble was serious and would probably necessitate an abdominal operation in about two months' time. He had said that "prevention was better than cure," that he could do something about it, and that he had treated similar cases. He had further said "I don't want to persuade you either way. You can always go and see a Harley-street specialist if you want to." Witness, having decided to have the treatment, was told that it would consist of 25 daily injections, which could be given locally. The second room he was taken to resembled a surgery; Dr. Collier took a sample of blood. There had been some difficulty in finding anyone to give the injections in Grantham, and he had suggested Nurse Pacey. In addition to the injection, he had received tablets from the Institute; these had given him relief and he had suggested their sending some more. He had received no benefit from the injections. He had refused to pay the balance of the fee because of the tone of the letters asking for it. In the end he had had back in full all that he had paid, after withdrawal of a county court action by the Institute. In the course of preparing for the action, the Institute had sent witness a copy of his medical history sheet, containing answers to some 34 printed questions. Mr. Harpman had asked him these questions.

Cross-examined, he agreed he had only seen Dr. Collier once, and what the doctor had done was not to diagnose the case but to take samples and make tests. He had never seen the name Collier in any printed matter, and had first heard the name after instituting proceedings.

Re-examined, he said he had consulted a doctor in Grantham before the proceedings began; this doctor had put him in touch with a firm of solicitors.

Mrs. Frieda Pacey, a State-registered nurse, testified to receiving a letter signed "H. Nunan Collier, L.S.A. London" beginning "Dear Nurse, My patient, Mr. Percy, needs a series of daily injections." She had given twelve intramuscular injections on alternate nights. She did not know what they contained, other than the statement in the letter that they were "gland extracts." She had ascertained that the writer of the letter was on the Medical Register.

Dr. F. J. Jauch, a Grantham practitioner, testified that Mr. Percy had consulted him for the first time in October, 1937, suffering from nervous dyspepsia. He had given advice and treatment; there was nothing to indicate operation.

Cross-examined, he thought it remotely possible but unlikely that Mr. Percy's condition was due to a condition of the pancreas; he had not complained of impotence.

Respondent, examined by Lord Reading, said he had been qualified since 1903; up to 1914 he had been in private practice. He had joined the R.A.M.C. at the beginning of the war, risen to the rank of major, been wounded and been discharged with a disability pension. He had practised privately in London and been employed by the Ministry of Pensions from 1919 to 1924. Then he had practised in Bloomsbury until 1933. He had gone to the Institute of Endocrinology in May, 1937, as a result of answering an advertisement in the *Times*. After interviews and references he had been offered a post. He had been interviewed by a "qualified" medical man and had had a discussion with him; that doctor was still there.

In reply to the President, he said he had not used the word "registered" and had not consulted the Register until later; he had not found the name on the Register.

In reply again to Lord Reading he said that his duties consisted of making diagnoses, and giving ultra-violet and X ray treatments. He had nothing to do with making up the glandular prescriptions given. He helped in prescribing and knew what they contained. Pancreatic gland was one of the standard preparations used; either he or Mr. Harpman decided which gland should be given.

In reply to the legal assessor, he said he did not see all the patients; he knew that Mr. Harpman saw some and the unregistered doctor saw some, and prescribed the injections.

Further examined, he said he knew nothing whatever about proceedings against Mr. Percy by the Institute and the counter charge of fraud. He had not the slightest idea at first that the Institute was advertising in the public press, but had seen one advertisement towards the end of last year. He knew the brochures describing the work; his name did not appear anywhere in the Institute's literature. It was his view that the Institute was doing very, very valuable work.

Cross-examined, he agreed that his letters to the Registrar set out what he felt. The medical staff of the Institute consisted only of himself and the other doctor mentioned. Mr. Harpman was a scientist of many years' experience. Witness had come to the conclusion that Mr. Harpman knew his work. He had been quite under the impression that

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his own work at the Institute was within the limits of the Council's Warning Notice, with which he was familiar. When he had seen the advertisement, he had not given it a thought because there had been a registered medical man connected with the Institute for years. He denied having seen Mr. Heber Percy at his first visit; he had seen him simply to take his blood pressure on his second visit. The bacteriologist had taken a blood and urine sample. He did not know who had prescribed for him. He had signed the letter to the nurse. He knew what the injections were but had not prescribed them. It was a common-form letter. He did not sign all such letters. He had never seen the medical history sheet at that time. He had not intended to mislead the nurse. He never prescribed for patients he had not seen. Some of the injections were made up at Harpman's own laboratory; he had never been there. Possibly some were bought. He could not say how they were standardised or who did that. He had taken Harpman's word for it.

Answering the legal assessor and members, he said he had made no inquiries about what the pamphlets were being used for. He was paid a salary—no commission. He saw patients who came to the Institute, and did not know or inquire how they heard of it. He spent from 10 to 6 at the Institute and had now no private practice. He had twice received Warning Notices, and had asked to have his name removed from the Register in order to be free. If he were off the Register he would continue his association with unregistered practitioners and with an institution that advertised. If he stayed on the Register he did not know what he would do.

The Council found the charge proved and directed the erasure of Dr. Collier's name from the Register.

II

The Case of John Herbert Hannan, registered as of 39a, Courtfield-gardens, London, S.W.5, L.M.S.S.A. Lond., 1921; M.B., B.Chir. 1926, M.D. 1927, U. Camb., who had been summoned to appear before the Council on the following charge:—

That being a registered medical practitioner: (1) you are or have been associated with or employed by Messrs. Miladin Limited, proprietors of the Rheumatism Clinic, 236, Brixton-road, Brixton, S.W.9, who to your knowledge and with your sanction and/or acquiescence have sought to attract patients by means of advertising in the public press and/or by means of canvassing; (2) you obtained Joseph Charles Hall as a patient by means of (*a*) a card sent by or on behalf of the said Messrs. Miladin Limited, without any request of his, and received by him on July 9th, 1937, at his residence, 15, Ribblesdale-road, Streatham, S.W.16, the said card being imprinted as follows:—

Proprietors: MILADIN LTD. Tel.: RAV. 3202.
RHEUMATISM CLINIC
236, BRIXTON ROAD, BRIXTON, S.W.9
FOR TREATMENT OF
RHEUMATISM
ARTHRITIS
SCIATICA
NEURITIS and
ALLIED COMPLAINTS
CONSULTATION 5/- & TREATMENT
by REGISTERED MEDICAL PRACTITIONERS
TREATMENT on THURSDAYS 2 p.m.–5 p.m.

(*b*) a reprint of an article entitled Sciatica Cured in Ten Minutes, published in the *News of the World* newspaper on July 12th, 1936, which was enclosed in an envelope with the said card. And that in relation to the facts so alleged you have been guilty of infamous conduct in a professional respect.

The complainants were the Medical Defence Union, who were represented by Mr. Oswald Hempson, solicitor.

Dr. Hannan was represented by Mr. H. Malone, instructed by Kingsley Wood, Williams, and Murphy, solicitors.

Mr. Hempson, opening the case, said that in July, 1936, the *News of the World* had printed an article lauding a new and remarkable treatment for sciatica, obtainable at a West End clinic where four doctors were working. The treatment was an injection of a solution of salts which separated the nerve-fibres, parted adhesions, and produced immediate cure. The article further claimed that each of the four doctors was a specialist, and that every patient was thoroughly examined all over. That article had attracted the attention of a great number of persons, and some of the replies had been forwarded to the Medical Defence Union. At that time sufficient evidence had not been obtainable to warrant complaint to the Council. In July, 1937, however, Mr. Hall, a clerk to Messrs. Hempsons, who had made inquiries at the clinic, had received a follow-up communication as set out in the charge. He had made an appointment and been examined at the clinic by respondent, who had made no disclaimer when the *News of the World* article was mentioned.

Joseph Charles Hall testified that he was a clerk employed by Messrs. Hempsons, that he had made certain inquiries at the clinic in 1936, and that in 1937, without any request on his part, he had received a circular as stated in the charge. He had attended the clinic on July 31st; a Mr. Morland had asked him to go into the consulting-room, and there had introduced him to Dr. Hannan, who had taken notes of his medical history, tested his grip, and examined his chest. Dr. Hannan had then injected distilled water into both arms and tested the reaction, and then said the complaint was primarily nervous and not rheumatic; the clinic could do nothing for him. He had produced the *News of the World* article and Mr. Morland had said that was due to Dr. Leitch and that Dr. Hannan had had nothing to do with it. He had paid five shillings. Mr. Morland had said that Dr. Hannan was a first-class man with a place in Harley-street, and advised him to do what Dr. Hannan said.

Cross-examined, he said he had not found or tried to find out who had inserted the effusion in the *News of the World;* he was not aware that it had been inserted by Dr. N. Leitch, M.R.C.P. The postmark on the envelope containing the follow-up was "Bromley." Asked to identify Miss Parker as the lady he had seen at the clinic, he was unable to do so. He had seen a young lady in the waiting-room. He still maintained that Dr. Hannan had injected a fluid into his arm without any warning, had said it was distilled water, and had shown him the syringe. He had paid the five shillings to Mr. Morland in the waiting-room. He insisted that the remark about the *News of the World* article was audible to Dr. Hannan though it had been addressed to Mr. Morland.

Mr. Malone, opening the defence, said that the first relevant date was July 12th, 1936, when the effusion appeared in the *News of the World;* Dr. Hannan had never heard of this article before the present proceedings. On April 17th, 1937, Dr. Hannan had advertised in the *British Medical Journal*, and had received a reply signed "J. Neil Leitch, M.D., M.R.C.P.," saying that Dr. Leitch required a part-time assistant in connexion with some rheumatism clinics in the London district. April 28th was the first attendance of Dr. Hannan at any of the clinics.

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On May 20th Dr. Hannan had written to the Registrar as follows:

In answer to an advertisement in the *British Medical Journal* I was employed by Dr. Leitch of 64, Great Cumberland-place, W., as part-time assistant in running clinics, which turned out to be for rheumatism. I do not feel happy regarding the ethics of the matter. The enclosed correspondence speaks for itself. I should deeply appreciate your advice whether I should carry on or not.

Enclosed with these letters were a card of the clinic, stating the consultation fee, five shillings; Dr. Leitch's actual letter to him about his appointment; and a further letter from Dr. Leitch about vaccine and vitamin preparations. To this he had received in reply:

The Registrar begs leave to acknowledge receipt of letter with enclosures, which shall receive attention.

On June 10th Dr. Hannan, having received no reply, wrote again to the Registrar:

Dear Sir,

Re assistantship to Dr. Leitch

As I have no answer to my letter, and am not feeling too happy about the whole ethical position of these clinics, I have tendered my resignation.

Yours truly,
J. H. Hannan.

On June 13th Mr. Morland had written to Dr. Hannan, sending him a holograph draft agreement between Miladin Ltd. and a doctor appointed as assistant physician. Mr. Morland wrote that Dr. Leitch had consulted the General Medical Council, and also had taken counsel's opinion to make doubly sure that there was nothing to prevent any doctor being appointed consulting physician to a company or clinic, and engaging assistant physicians, provided that the company did nothing which was against the rules of the British Medical Association.

Dr. Hannan had insisted on adding to the agreement, and had himself written into it, a clause stating that it might be terminated if the General Medical Council decided that his employment was unethical. Dr. Leitch had refused to sign it with this clause in.

On July 14th Dr. Leitch had written to Mr. Morland saying he would like to see him some time at No. 64 Great Cumberland-place because Dr. Hannan had written him a rather disturbing letter. This enclosed a letter from Dr. Hannan saying:—

The best thing we can do is to get the authority of the Registrar of the General Medical Council before you spend any more money. If your company employs only registered medical practitioners, then the Registrar must have the final say in what we can do or cannot do. I suggest you ring him up at Langham 2727. Counsel's opinion is of no value, nor is that of the B.M.A.

Dr. Hannan, examined, said that he had at the first interview taken up the ethical position with Dr. Leitch, and had received the assurances subsequently repeated in Mr. Morland's letter. Dr. Leitch had said he had had spa experience and was concerned with the difficulty of getting rheumatism treatment for poor persons. Dr. Hannan's duties were to examine, diagnose, and refer the patients to their own doctor—nothing else. When he had attended at the clinic he had seen that each patient was given a card. On this card, he found, were the words "Fee 5*s*." He had felt and said that this was irregular and had resigned. Subsequently a long argument had ensued, Dr. Leitch declaring that respondent was letting him down. Therefore Dr. Hannan had returned to the clinics, after being away for three weeks following his resignation on June 10th. He had had an absolute assurance given him that the cards would no longer be issued. He had kept a watch, and had not seen any more cards during this period.

He could not understand the suggestion that he had given an injection; there was no truth in it. Possibly Mr. Hall had got confused with the tests for hot and cold. He had not injected him in either arm, he was sure, though he could not remember Mr. Hall from other patients a year ago. He would have tested him with a needle in both arms, and quite possibly he had used a hypodermic needle with syringe attached, but not with any injection. He absolutely denied hearing any discussion about the *News of the World* article. He knew nothing about the receipt. He said he had no idea how the clinic expected to get its patients. He was not interested in the success of the clinic as he was merely paid a fee. Of course, he would lose the fee if the clinic closed down. He had not liked the look of the cards, because they had looked like invitations. He had inquired of all patients the names of their family doctors, but many patients had refused to give the name. He could not specifically recollect asking Mr. Hall for the name of his doctor but pointed out names of such entries in his books. He had made no inquiry about publicity as he had seen no evidence of it. There was a board outside the clinic saying "Rheumatism Clinic" with no mention of the proprietor.

Re-examined by his counsel, he said he had looked up Dr. Leitch's qualifications in the Medical Directory and had formed the opinion that a man with such qualifications would be unlikely to associate himself with any unethical practice. He had written to the Council without the knowledge of Mr. Morland or Dr. Leitch, and before resuming work had, either in person or by a member of his household, telephoned to the Council six times in an attempt to get advice. He had been told by a male person, whom he had taken to be the Registrar, that if there was no advertising he would be in order. He had complained about the cards and Dr. Leitch had assured him that they had been withdrawn.

On the recommendation of the legal assessor, the Registrar of the Council, Mr. Michael Heseltine, and every member of the male staff who had been employed in June and July, 1937, then gave evidence that they had no recollection of any conversation with Dr. Hannan or anyone on his behalf. In answer to Mr. Bishop Harman, who asked whether it was the habit of the office to answer either general or particular questions on ethical matters over the telephone, the Registrar said that it was impossible always to avoid so doing. Cross-examined by Mr. Malone, he said that no reply had been sent to the inquiries in Dr. Hannan's letters. The first had coincided with the eve of the summer session of the Council, which entailed a great volume of work, and he had taken the second letter to indicate a decision by the practitioner which would dispose of the matter. It might well have been that someone in the office, being asked on the telephone a question relating to correspondence about clinics, had said that clinics were all right so long as there was no advertising. Mr. Hempson asked whether anyone but the Registrar was authorised to advise inquirers. Mr. Heseltine replied, "Nearly all of us have to do it from time to time." In answer to Sir Robert Bolam, he said that a letter of the kind in question was not answered on the responsibility of any officer of the Council but only with the authority of the President, who, apart from inquiries before the Council as a

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whole, would give such advice as he thought fit to practitioners on this kind of question. If the first letter had not arrived at that particular time (just before a half-yearly session), he would have hoped to draft a reply to be submitted to the President for his approval; the reply as approved would then have been sent to the practitioner. Such a letter was not to his knowledge submitted to the Council during its session. The Council would only deal with a formal complaint.

Mr. Malone then called Mr. Charles Morland, who said that he had formed a company to run clinics on continental lines, which he had studied. He had become acquainted with Dr. Leitch through an advertisement in the *Times*, and had seen him at 64, Great Cumberland-place and discussed the formation of clinics. Dr. Leitch had produced a list of several hundred names from replies that he said had been sent in answer to the "write-up" which had appeared in the *News of the World*. The list was an obvious potential source of profit. Dr. Leitch said he already had three clinics, and was able to do so because they were run under the auspices of the National Institute of Nutrition. He had inspected the clinics and agreed with Dr. Leitch that they should be advertised on the screen at a picture theatre and in a suburban newspaper, and proposed that when they had been worked up the old ones should be closed and new ones opened. He had never seen Dr. Hannan until April 28th, when a new clinic had been opened at Bromley. It had been arranged that Dr. Leitch should attend this opening, but Dr. Hannan had in fact appeared instead. The respondent had asked him whether he had been with Dr. Leitch into the question of whether the cards were ethical. Witness had repeated to respondent what Dr. Leitch had said about the steps he had taken. After receiving Dr. Hannan's letter of July 11th, he had telephoned to the Registrar and had spoken to someone whom he had supposed to be the Registrar. He had asked whether the clinic, having a consulting physician, might advertise. The person on the telephone had replied that he would not state a case; the question might arise that, although the clinic was not advertising a particular doctor, it was advertising *a* doctor, and if a complaint were lodged the Council might have to consider the point. Witness had replied that he wished only to work under the direction of the British Medical Association and would not advertise. From that date he had cancelled all advertising contracts. He had never discussed the commercial side of the clinic with Dr. Hannan, who had merely arrived on Wednesday afternoons, received his fee in advance, attended the patients, and left. After he had examined Mr. Hall, he had taken no notice whatever of the further transactions.

The Registrar, recalled, said that he had no recollection of a conversation with Mr. Morland, but he had no criticism to make of the answer which Mr. Morland recollected.

The President, announcing the decision of the Council, said:—"Dr. Hannan: I have to inform you that the facts alleged against you in the charge have been proved to the satisfaction of the Council. The facts so proved bring you within the terms of the Warning Notice of the Council in regard to the practice of indirect advertising or of canvassing by any registered medical practitioner. The Notice explicitly states that you must be presumed to be aware that any registered medical practitioner found to have been guilty of advertising, whether directly or indirectly, or of canvassing, for the purposes of obtaining patients, is liable to have his name erased from the Medical Register. The wording of the Notice should have been sufficient to show you, apart from these proceedings, that the Council take a grave view of the forms of professional misconduct which have been proved in your case. The Council are, however, willing to afford you a further opportunity of realising your position in relation to the charge, and they have for this purpose postponed their judgment until the session in May, 1939. Before that time you will be required to produce testimony from persons of standing, including professional colleagues, as to your habits and conduct in the interval. In considering that testimony the Council will pay particular regard to the question whether it satisfies them that you have not resumed your employment with the organisation mentioned in the charge, or accepted any similar employment."

UNSUBSTANTIATED ALLEGATIONS

The Case of James Thomas Hallett, registered as of 10, Downs-road, Folkestone, M.R.C.S. Eng., 1935; L.R.C.P. Lond., 1935, who had been summoned to appear before the Council on the following charge:—

That being a registered medical practitioner and employed as an assistant by Dr. Herbert Max Livingston between Dec. 9th, 1936, and Jan. 7th, 1937: (1) you caused to be printed, and circulated, without the knowledge or consent of Dr. Livingston, forms of medical certificates and notepaper, the headings of which implied that you were in partnership with Dr. Livingston when in fact you were not, and were further calculated to imply, by the omission of the address and telephone number of the premises—namely, 22, Uxbridge-road, Ealing, W.5, Ealing 0786—where his main practice was carried on, that his practice had been transferred from the said 22, Uxbridge-road, Ealing, W.5, to the premises where branches of his practice were carried on under your charge as his assistant; (2) you withheld, or attempted to withhold, services which it was your duty to render to patients of the practice of Dr. Livingston—namely, Mrs. Magill, on behalf of her daughter Mrs. McGregor, and Mrs. Evans—in attendance at the premises where branches of his practice were carried on under your charge as his assistant; (3) you attempted, without the knowledge or consent of Dr. Livingston, to induce a patient of his practice—namely, Mrs. Magill, on behalf of her daughter Mrs. McGregor—to seek treatment from a registered medical practitioner not associated with the practice of Dr. Livingston; and (4) you attended patients of the practice of Dr. Livingston—namely, Mr. Griffiths, Mr. Blackebie, Miss Bennet, Mr. Watson, Mr. J. Pearce, Miss Osgathorpe, and Miss Cambrook—contrary to his express instructions, at a time when, as you well knew, you were suffering from an infectious disorder—namely, chicken-pox—and when you were, moreover, in the acute stage of that disorder. And that in relation to the facts so alleged you have been guilty of infamous conduct in a professional respect.

The complainant was Dr. Herbert Max Livingston, M.B., B.S., 1907, M.D., M.S. 1910, U. Durh.; F.R.C.S. Eng., 1921, who conducted his own case. Respondent was represented by Mr. Pereira, counsel, instructed by Messrs. Le Brasseur and Oakley on behalf of the London and Counties Medical Protection Society.

The complainant read out a long statutory declaration which constituted his evidence. He admitted that, on precisely the same facts as those which he proposed to prove before the Council, the county court judge at Brentford had awarded £72 damages and costs to Dr. Hallett in an action for wrongful dismissal. He pointed out that Dr. Hallett had admitted in those proceedings the unauthorised use of notepaper and his suspicion that he had had chicken-pox on the material date. The legal assessor directed the complainant to read the judgment of the county court judge, who said that he was quite

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satisfied that Dr. Hallett had had no intention of holding himself out as a partner, although he admitted it was an unfortunate mistake to have had the note-paper and certificates printed as he had. He had acted with complete innocence. The learned judge said that generally on questions of fact the plaintiff was a much more dependable witness than the defendant and that he had at all times preferred his evidence to the defendant's when in conflict. Dr. Livingston said that Dr. Hallett's impudent and unrepentant attitude in bringing the proceedings in the county court was the chief motive for his complaint. Before those proceedings he had contented himself with an informal letter to the President, but since then he had considered it his duty to bring Dr. Hallett to a sense of his professional responsibilities.

After the complainant had called evidence, and Dr. Hallett had given evidence, Mr. Pereira declared that the case was ripe with malice, and was nothing more nor less than persecution. The truth was that Dr. Livingston could not get over his annoyance at losing the county court case. It was a grave hardship for a young man like Dr. Hallett, at this stage of his career, to have to stand up again, before a professional tribunal, on these four matters, exactly the same as the matters in issue in the county court, and to undergo a trial which was bound to affect him, no matter what the issue.

After a very brief consideration in camera, the President announced that the Council had not found the charges proved.

Committee Business

DENTAL CURRICULUM

The Council adopted a series of amending recommendations by the Dental Education and Examination Committee dealing with the curriculum and examinations for candidates requiring licences in dentistry. These provide that, subject to exceptions in individual cases, every dental student at the beginning of his studentship shall be registered in the same manner as a medical student and under the same conditions with respect to age, preliminary examination, and additional examinations. Applicants for registration may commence professional study. An applicant who has served two or more years as an apprentice in dental mechanics may, if the licensing bodies think fit, be allowed to antedate his registration for a period not exceeding six months. Every student on registration must furnish evidence that he is 18 years old or will be so within three months. The preliminary and additional examinations are the same as those required for medical students. The paragraph in the existing recommendations which laid down that no portion of practical instruction taken before registration should be reckoned as a portion of the four years of professional study required is now rescinded.

THE BRITISH PHARMACOPŒIA

The Pharmacopœia Committee reported that a total of 721 copies of the British Pharmacopœia, 1932, and 637 copies of the Addendum, 1926, had been sold during the previous six months. The British Pharmacopœia Commission reported, through the Committee, that the revision of the monographs of both volumes which it was proposed to retain was nearing completion. A total of 522 monographs had now been completed and the recommendations would be published later in the year. The Commission hoped in this way to obtain the criticisms and comments of as wide a circle of experts and interests as possible. Many suggestions, both official and unofficial, had been received for the composition of the next Pharmacopœia. Two papers on work done at the request of the Commission had been published: Glycerin of Starch: a study of the effects of storage, by I. Roberts; and The Assay of Liquid Extract of Ergot, by C. H. Hampshire and G. R. Page.

MEDICINE AND THE LAW

Hospital Mortuary as Alleged Nuisance

THE Surbiton Hospital, erected in 1936, has had to defend itself against an action by an owner of neighbouring property who complained of the objectionable sights, sounds, and smells of the hospital's mortuary and post-mortem block. The building, he said, was only 16½ feet from the boundary wall of his property. His house was let to a tenant, Miss Tomlin, who conducted it as a guest house. Miss Tomlin could accommodate six guests; she now had only four and these were paying much less than formerly because people would not pay to live next a mortuary. Miss Tomlin consented to remain as tenant only if her rent was reduced. Extracts from her diary were read and discussed. She and her sister had seen bodies conveyed to and from the mortuary room. Noises from that room, apparently caused by the use of hammer and chisel, reverberated through her house. On one occasion a body was removed without a covering sheet; the head rolled from side to side as the bier was being carried along. Undertakers' men passed the windows of her dining-room where her guests were dining. There were unpleasant smells, "the smell of death." Her sister, who had been a trained nurse, recognised the odour and corroborated the evidence. The hospital gardener said he thought the smell was caused by the coke burning in his greenhouse chimney, but this explanation had not been suggested to the plaintiff. A pathologist who conducts examinations for Surrey coroners was emphatic that the hospital's mortuary was modern and well laid out. The Surbiton sanitary inspector thought the block excellent in design and construction; he did not think the plaintiff's tenants could see the mortuary entrance unless they deliberately leant out of the window. Counsel for the hospital contended that the complaints were based on sentiment and psychological obsession. The case rested on "the hair-trigger noses" of the ladies who occupied the plaintiff's house. The matron denied the suggestions of nuisance and said it would be a grave handicap to the hospital if post-mortem examinations were barred from the mortuary. The hospital secretary told how a protective screen, 8 feet high, had been erected between the two properties. There were three acres of hospital grounds, but the mortuary could not be built in a different place without interfering with the plans for future extension of the hospital.

Mr. Justice Gavin Simonds, after hearing the evidence, gave the parties a strong hint to come to terms. He had indicated his surprise that no member of the hospital committee had gone to the plaintiff's house to see if there was any justification for the complaints. Observations from the bench seemed to indicate that the complaint of distressing sights alone would scarcely justify the grant of the remedy demanded by the plaintiff. There was also apparently a possible defence in the contention that depreciation of the value of a house by an alleged nuisance affecting the occupiers does not give the reversioner a right to

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an injunction—at any rate when there is no threat of constant recurrence. The legal position, however, was not elucidated. The parties took the judge's hint and came to terms. The hospital agreed not to hold post-mortem examinations in the mortuary and to alter arrangements so as to prevent any further nuisance to the plaintiff. Few people would really welcome the building of a post-mortem room within a few feet of the windows of their home. It would scarcely enhance the commercial value of their property. On the other hand, the community must have hospitals in populous centres, and it is reasonable to equip a hospital with a mortuary and post-mortem room. These things are not nuisances in themselves, nor is it possible to hide them away in remote solitudes.

The Nurse as a Defendant

The growing recognition of the status of the nursing profession carries with it an increase of legal responsibility. The State-registered nurse undergoes a long and careful training and she emerges with a high reputation for skill and judgment. It follows that she becomes the target for those harassing claims, often speculative and ill-founded, which patients seem to show an increasing tendency to bring in the law courts against those who have done their best to deserve a more grateful acknowledgment of services rendered. In the missing-swab or in the hot-water bottle cases—to mention two constantly recurring types of litigation—the relative responsibilities of surgeon and nurse are not yet clearly defined. If both are cited as defendants, their interests may conflict. Lately in Mahon *v.* Osborne at Manchester assizes the defendant nurse seemed to have assumed that her cause would be looked after by the legal advisers of the defendant surgeon. As the legal advisers made plain, it happened that the interests of the two defendants would best be served by separating the defences. Such instances show that the time has now arrived for the State-registered nurse to obtain individual protection from the possibly serious consequences of allegations of professional negligence. The College of Nursing, it is understood, offers its members free legal advice as one of the privileges of membership; but the nurse who becomes involved in legal action has to bear her own expenses. At the end of 1936 a scheme was accordingly devised by the college whereby, for an annual premium of 7*s.* 6*d.*, a nurse could be insured against possible claims up to £1000. If there has so far been little enthusiasm among nurses to take advantage of the special policy devised for this purpose by a well-known insurance company, this may be because the individual nurse, trained to identify herself with the interests and concern of her hospital, does not visualise herself as the possible victim of litigation. The risk is present, nevertheless, and it is probably an increasing risk. It makes all the difference in the world to the surgeon if he knows himself to be protected against the anxieties of unexpected claims and the burdens of unfathomable verdicts, and the nurse needs the like relief from these worries. She will obtain such relief only if she gives serious consideration to some system of professional insurance.

GRAINS AND SCRUPLES

Under this heading appear week by week the unfettered thoughts of doctors in various occupations. Each contributor is responsible for the section for a month; his name can be seen later in the half-yearly index

FROM A LONDON PRACTITIONER

I

THERE is an odd thing about general practice. At openings of medical schools, public meetings, and places where they speak it is held in esteem. The general practitioner is the Backbone of the Profession, and one can hardly suppose the function of a structure so important could be ignoble, paltry, or of doubtful value. Elsewhere and upon other occasions general practice, if not the general practitioner, is belittled and decried by speakers and writers within and without the profession for many and, sometimes, conflicting reasons.

"Oh," said a candidate for a resident post when asked concerning her ultimate professional ambitions (I think it was a she), "I suppose I shall drift into general practice." It was not a tactful answer, for the committee interviewing her consisted mainly of general practitioners, and the appointment went elsewhere, but she voiced a common opinion. General practice is what you do if you have not the distinction or ability to do anything else.

Others condemn it for a contrary reason. Medicine, they say, has become so vast that general practice is an impossible conception. Absurd to attempt anything so diffuse. No one can be big enough for it. The general practitioner can be nothing other than the complete smatterer. Young men in the pride and glory of their second or third resident appointment have sometimes the curious belief that the practising doctor sees little or no real organic disease or, if he does, must instantly abandon responsibility and hand his patient on to someone else. Manifestly, the young man couldn't stand a life like that, he must specialise. Other young men cannot believe in the possibility of honest private practice, especially if it be general, and one such assured me that he was hoping to enter a State medical service (in Uganda, I fancy) for the express purpose of saving his professional soul. I told him that it was not really so bad as that, but he looked politely incredulous. He may now, for all I know, be an honest private practitioner, or he may be under discipline in Uganda, saying to himself as he reads Dr. Cronin under a mosquito-net, "There, but for the grace of God, goes X.Y.Z." Other critics are shocked at the lack of Coördination, Scientific Method, System, and The Preventive Spirit. One such (himself a surgeon) expressed the hope that the medical students he was addressing "would not be content to become merely tradesmen in health, selling their skill in the treatment of declared disease."

* * *

Of lay depreciators, many have their judgment warped by the magic of the word "specialist." One of these, they suppose, exists not only for each region, organ, and tissue of the body but for each several disorder of these various parts. It is obvious that the specialist is the man who knows and to whom you should go if only you can find the right one. Per contra, the general doctor (unless indeed he be a General Specialist) can scarcely be of much account. As for the G.P. (for this deplorable abbreviation has to come, sooner or later) he does not always decry himself. Often enough he is manifestly

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contented with his lot, knows he has a job worth doing and, like a wise man, says nothing and carries on, but sometimes he turns querulous and laments both present and future. All things are taken from him; he is becoming a mere rubber stamp for certificates, a pedlar of soothing syrups, the State has got him (or had better get him, according to political complexion), and in any case Ichabod, the glory is departed, individual medicine is at an end.

* * *

It is frankly astonishing to contrast these pictures with personal experience. True, I can speak only of one general practice. The lot has fallen unto me in a fair enough ground and I can easily imagine that economic circumstances may, to put it bluntly, spoil the whole show. No doubt they often do, but that is not to the point. The critics I have quoted decry or belittle not practice ruined by economic circumstances but general practice itself.

Manifestly such practice is not for everyone. It is not for the man at heart a scientist, curious for precise knowledge and controlled experiment, nor for one for whom the morbid process is more than the patient, or for whom disorders without material pathology seem outside the field of medicine; and, like all medical practice, it is not, or should not be, for the fortune-hunter; but for the less precious sort it provides a full and varied day's work, scope for all the skill in observation and diagnosis a well-trained man can possess, as much responsibility as anyone not a glutton for it can demand, an unsolved riddle to take to bed nightly (in place of the cross-word puzzle), and if you add together the excellent professional exercise, the proportion of good done (if restoration of health or relief of pain or anxiety be a good), the thanks and the cash, there remains after all proper deductions for trivialities and wasted time, failures, ingratitude, and bad debts, a better credit balance than most receive for a day's honest work in this very imperfect world. Nor is this the end of the catalogue, for a man with surgical skill need only choose his practice with discretion to find scope for that too. Let us agree that (for example) a man capable of thinking his way through the brain in three dimensions would be wasted as a general practitioner with neurology calling out for him; and that certain flairs and special dexterities rightly mark their possessors for special provinces, yet these exceptions do not invalidate the truth that no one can be too good for general practice.

* * *

But can anyone be good enough?

Doubtless the perfect practitioner, like the perfect painter, the perfect mother, the perfect Prime Minister, or the perfect cook, is a rare bird. The Art is long and difficult. But it is absurd to pretend that there is something hypocritical or fantastic in aiming at or pretending to a degree of all-round competence which justifies the term "general practitioner." It is perfectly possible to be capable of making an informed and purposeful examination of a patient with any sort of complaint, general or local. It is perfectly possible to possess the requisite knowledge and skill for making a diagnosis in a large majority of cases, and to know what special investigations are needed in the remainder. It is equally possible to have the knowledge and skill to carry through the treatment in the great majority and to know what should be done, or at least to whom to turn, in the minority.

The "too wide" criticism forgets that common things are by far the commonest, that rarities can generally be spotted for rare without very much trouble, and that on the whole the same methods of investigation prevail in every province of medicine. A vast knowledge of detail is not required; unremitting care, trained skill in clinical examination, imagination, and a sufficient knowledge of possibilities are what are needed. They are in the possession of many, and within the competence of many more.

PUBLIC HEALTH

Milk in Schools

THE Milk Nutrition Committee was set up, under the chairmanship of Lord Astor, shortly after the milk-in-schools scheme had been launched, and they decided to include in their programme of experimental work a study of the effects upon growth and health of the amounts of milk usually consumed by children under that scheme. An equally important issue, which could be studied in the same trials, was the relative value of raw and pasteurised milk. For the purpose of these observations five areas were selected —Luton, Wolverhampton, Burton-on-Trent, Huddersfield, and Renfrewshire—and rather more than 8000 children were enrolled. These children were allocated at random to four groups of equal size, each group having a different dietary supplement (given daily)—viz., (1) ⅓ pint pasteurised milk, (2) ⅔ pint pasteurised milk, (3) ⅔ pint raw milk, (4) biscuits. These supplements were given over a whole calendar year, the children meanwhile being examined and measured by specially appointed medical officers at three-monthly intervals. Some of the results of this large-scale experiment are now given in an interim report of the committee,[1] which relates to the three-quarters of the children who were present at all four quarterly examinations. The analysis is also limited at present to the changes in physique observed between the beginning and end of the year of trial. Over this period of time the different groups have shown growth rates which certainly differ, but not very largely. The average increase both in height and weight was least for the children whose supplement was biscuits, rather larger for those whose supplement was ⅓ pint of milk, and greatest for those who had ⅔ pint, and that order appears to be general for each area and age-group. But comparing the extreme groups, those with biscuits and those with ⅔ pint of milk, the absolute differences only amount to about one-tenth of an inch in height during the year and to less than a pound in weight. Put relatively, the boys with biscuits increased their initial height by 4·16 per cent. and their initial weight by 10·87 per cent. compared with corresponding figures of 4·4 and 12 per cent. for boys with ⅔ pint of milk. For girls the corresponding figures were 4·66 and 12·75 per cent. in the biscuit group, 4·8 and 14 per cent. in the ⅔ pint group. The differences, though consistent, are clearly not very impressive. Perhaps even the larger amount of milk given is not sufficient to affect the growth rate materially, but it may well be that the experiment is not a fully effective one owing to the necessary lack of supervision of the home diets. The child given biscuits at school may well

[1] Milk and Nutrition. New experiments reported to the Milk Nutrition Committee. Part II. Interim Report. Pp. 34. 1s. 9d. Obtainable from the National Institute for Research in Dairying, Shinfield, Reading.

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have milk added to his home diet by a mother continually instructed in its value, while he who has milk at school gets no more at home; in other words the control is not an effective control.

That possible complicating factor should, however, not be present to the same extent, if at all, in the comparison of the groups on equal quantities of raw and pasteurised milk, and the committee's conclusion on this point is important. It is that whether comparisons be made of the increments of growth in the total of children, or in subdivisions by age, area, and clinical assessment, there is no consistent difference between children on ⅔ pint of raw milk and children on ⅔ pint of pasteurised. The committee qualify this statement by pointing out that the increments over the group on biscuits are so small that it is doubtful whether slight differences between the nutritive values of raw and pasteurised milk in supplements of the amount given could be revealed in measurements of height and weight, but as pointed out above the latter comparison may easily be a more sensitive one than the former. Actually, taking the total group of children, boys with ⅔ pint of pasteurised milk increased their height over the year by 2·25 inches and their weight by 7·11 pounds; those on ⅔ pint of raw milk increased by 2·21 inches and 7·16 pounds. For the corresponding group of girls the figures were 2·43 inches and 7·99 pounds in the pasteurised group, against 2·42 inches and 8·30 pounds in the raw group. The differences are clearly negligible. In an addendum are some figures which show that the group on milk also surpassed the group on biscuits in their chest measurements and their strength of pull. The committee have obtained full details of school absences and other measures of health and their final report should contain interesting information on the relation of the supplements to general health as well as to growth.

An Advisory Medical Committee in Croydon

The Croydon typhoid tribunal in its report suggested that in all large areas there should be a committee representing local practitioners which would be available for pooling and distributing information if an outbreak arose. Croydon doctors were asked to submit their observations on this proposal and a joint meeting of the Croydon branch of the B.M.A. and the local medical and panel committee resolved that an ad-hoc consultative committee should be set up by these bodies and that from this a small executive should be appointed which the council might consult when necessary. It was further suggested that the borough council should be asked to coöpt four medical men on to its public health committee. The special typhoid committee of the council considers that coöperation between local doctors and the public health service can be secured without coöpting non-members on to an important spending committee of the council and suggests instead an advisory committee comprising four members appointed by the local practitioners' organisations and six by the public health committee. This body would meet at regular intervals for discussion and would submit its recommendations to the public health committee. It is the opinion of the typhoid committee that the method would have the advantage of preserving the statutory position of the medical officer of health as the council's adviser on public health matters, and the council has now endorsed this view.

CORRESPONDENCE

CHEMOTHERAPY OF PNEUMOCOCCAL AND OTHER INFECTIONS

To the Editor of THE LANCET

SIR,—The results in the animal experiments (reported in your issue of May 28th by Dr. Whitby) on the treatment of pneumococcal infections with 2-(*p*-aminobenzenesulphonamido)pyridine (M. & B. 693) have been tested clinically during the past three months in cases of lobar pneumonia in adults and broncho-pneumonia in infants at Dudley-road Hospital, Birmingham.

The final assessment of the clinical results requires careful analysis before publication, but in a series of more than a hundred cases of pneumonia and broncho-pneumonia the mortality has been very definitely lower than in a similar number of control cases during that time, and toxic symptoms, even with large doses of the drug, have been conspicuously absent.—We are, Sir, yours faithfully,

G. MARY EVANS,
WILFRID F. GAISFORD.

Dudley-road Hospital, Birmingham, May 30th.

To the Editor of THE LANCET

SIR,—It was with great interest that we read Dr. Whitby's article and your annotation on the effect of 2-(*p*-aminobenzenesulphonamido) pyridine (M. & B. 693) on coccal infections in mice; for during the past six weeks we have had the opportunity of testing the effect of this new compound on gonococcal infection in man. A supply of tablets, each containing half a gramme, was kindly made available by Messrs. May and Baker Ltd., together with laboratory data concerning tolerance by various animals.

The drug has been administered to 36 adult male out-patients and 7 children who were in-patients. In adults the customary dose was 3 grammes daily, and some cases have shown toxic symptoms as early as the third day on this dosage; but other patients have received as much as 50 g. during three weeks with no signs of intolerance. The usual instructions for the avoidance of sulphur-containing foods and aperients were given. The trial of a larger daily dose in a few cases appeared to increase the incidence of toxic effects without increasing the therapeutic value, and trial of a dosage less than 3 g. daily is in progress.

Toxic effects were observed in 10 of the 36 adult cases and included two cutaneous eruptions (one of photosensitivity and one of generalised macular drug eruption); gastro-intestinal disturbance (anorexia, nausea, vomiting, and diarrhœa) was encountered in 4 cases; and 4 patients also complained of headache, depression, and dizziness. Evidently this new compound will not prove to be without effect upon leucopoiesis, for we observed moderate granulocytopenia in 4 cases, and doubtful cyanosis in 1. Sulphæmoglobinæmia or methæmoglobinæmia was not detected in 22 complete blood examinations, and these also failed to reveal any definite depression of the erythroblastic system. It is of interest that the patients exhibiting skin eruptions had both previously shown a similar reaction to sulphanilamide.

As regards the effect of this compound in untreated cases of acute gonococcal urethritis, 11 out of 16 under treatment showed no visible discharge and no symptoms after two days. In the other 5 cases this

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state was not attained until the fifth day. Subsequent observation for a period of two to three weeks from the cessation of this therapy has revealed no sign of relapse and no complications of the gonococcal infection. In all cases except 1, which received no adjuvant treatment, daily irrigation with potassium permanganate (1 in 8000) was also employed during the period of chemotherapy.

Of an additional group of 10 cases which had failed to respond to treatment with sulphanilamide, or which had relapsed after it, a rapid response was effected in 7. Since, however, the new compound has been given at a stage of the disease (3–16 weeks) when the gradual production of antibodies is likely to be well advanced, any direct comparison of these two drugs will be weighted against the one that was first employed. The apparently superior efficacy of 2-(*p*-aminobenzenesulphonamido) pyridine must therefore await further judgment in this respect. In 2 cases the gonococcal infection was not influenced and the remaining patient defaulted.

The effect of this new preparation in gonococcal vulvo-vaginitis is also of interest. A group of 7 children aged from twenty-two months to seven years, under the care of Dr. Morna Rawlins and Dr. D. Kathleen Brown of this clinic, were treated for four days with a dosage varying from 0·75 to 1·5 g. daily. The clinical signs of the disease disappeared in three days in all cases and subsequent microscopical examinations have failed to reveal gonococci, which were numerous in each case at the commencement of this treatment. One of these infants had previously failed to respond to two weeks' therapy with sulphanilamide. Vomiting occurred in 3 children who appeared otherwise in good health. Complete blood examinations were carried out on 5 children, 1 of whom showed a mild granulocytopenia. None of these children have been observed for more than a fortnight from the cessation of treatment but no relapse has been noted up to date.

It is clear that this new compound, given by mouth, has a markedly beneficial effect in a considerable proportion of cases of gonorrhœa. In view of the well-known tendency of this disease to relapse it would obviously be premature, however, to attempt to assess the value of the remedy on the basis of a few cases treated for a short time. Although Dr. Whitby's paper indicated that the new preparation is relatively non-toxic in small doses in animals, our experience in man suggests that a dosage comparable with that usually advised for sulphanilamide will give rise to comparable toxic effects.

We are, Sir, yours faithfully,

V. E. LLOYD,
D. ERSKINE,
A. G. JOHNSON.

Venereal Diseases Department,
Guy's Hospital, S.E., May 30th.

ASSISTANCE TO AUSTRIAN MEDICAL STUDENTS

To the Editor of THE LANCET

SIR,—As the matter is one which concerns the profession as a whole, I enclose hereunder a letter which has been circulated to the deans of the medical schools in the British Isles.

"We are all very naturally exercised about the treatment and unhappy prospects of our colleagues in Austria. I think there is general agreement in the profession that there is no longer room for any great increase in the number of foreign doctors allowed to practise in this country and that the best we can do, where possible, is to offer asylum to individuals.

"The question of the medical student seems to some of us to be in a rather different category and I am wondering whether we might not make some concerted effort to provide opportunities for a limited number of Austrian medical students in the British Isles for whom racial origins or political views have made life in their own country no longer possible.

"The London Hospital, I understand from Dr. A. E. Clark-Kennedy, the dean, have generously undertaken to take one student free of charge for the whole of his medical curriculum on the understanding that his board and lodging can be privately provided.

"I would like to offer the suggestion that each medical school should undertake the free education of one student in this way and on these conditions. You will appreciate that this is a very different thing from allowing dilution with Austrian Jewish practitioners who obtain a quick qualification in some university in this country. By the time he is qualified, a student entered from the beginning of his course would be eligible for naturalization. By that time also we may anticipate that the high figures of entry into the profession will in all probability have fallen off.

"I shall be most grateful if you could bring this suggestion to the notice of your school council."

If a medical education from the first year could be assured for a group of students in the manner indicated, lives at present deprived of hope and prospects would again have meaning. Homes would also be needed, but it is not to be doubted that medical men and others in a position to do so would be gladly forthcoming as adopters.

I hope and believe that the example of the London Hospital will be followed elsewhere.

I am, Sir, yours faithfully,

Cambridge, May 30th. JOHN A. RYLE.

"ALCOHOLIC" BERI-BERI

To the Editor of THE LANCET

SIR,—I was greatly interested in the cases of congestive heart failure following bouts of heavy drinking mentioned by Dr. Soltau in his letter published in your issue of May 7th. I think there can be little doubt that such cases are essentially similar to the one recorded by me (THE LANCET, April 9th) and to those of severe type described by Weiss and Wilkins, all of whom were addicted to alcoholic excess.

Dr. Soltau suggests that the symptoms may be due in part to the direct poisoning effect of alcohol on the cardiovascular system rather than to deficiency of vitamin B_1. It is of course difficult to refute this, nor I think is there any need to do so provided that it is recognised that avitaminosis plays the major part. Some of the evidence in support of this contention may be recapitulated briefly as follows.

In the first place there is the undeniably close clinical similarity to "wet" beri-beri in the orient. The lowering of the diastolic blood pressure and audible arterial bruit present in Dr. Soltau's cases are a particularly striking feature in the ordinary beri-beri heart and form the basis of the adrenaline test which Wenckebach and Aalsmeer regard as pathognomonic. Reversible cardiac enlargement and a shortened P–R interval may afford additional points of similarity. Secondly, there is the rapid disappearance of cardiac signs both in alcoholic and endemic beri-beri following injections of vitamin B_1. Thirdly, it has been shown by Joliffe and Colbert that an adequate intake of vitamin B protects against cardiac and neural damage even although large amounts of alcohol are consumed daily. Repeated confirmation of Shattuck's original premise makes the evidence so strong at present that it is difficult to believe that direct poisoning by alcohol can have more than a minor influence in the genesis of this syndrome.

I am, Sir, yours faithfully,

Clifton, Bristol, May 22nd. N. L. PRICE.

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DIASTOLISATION

To the Editor of THE LANCET

SIR,—In his letter in your issue of May 7th Dr. Douglas Guthrie refers to my article of April 23rd and asks whether the bulb is compressed once, or a number of times by separate efforts, or whether a rhythmic continuous movement over a certain period of time is imparted to the bulb. The reply is that the bulb is compressed by separate efforts about ten times per minute, the tube being at the same time moved slowly to and fro. This is indeed a very important point, and I am grateful to Dr. Guthrie for having made this inquiry. Prolonged rhythmic movements which produce successive rapid alterations of pressure within the tube are not what is expected in diastolisation; it is not to be considered as merely an intranasal massage, but rather as a stimulation of the mucous membrane and its nerve-endings.

Since writing my article I have heard from a number of medical men to the effect that they have been using diastolisation for hypertrophic rhinitis and allied conditions in children as well as in adults with encouraging results.

I am, Sir, yours faithfully,

Harley-street, W., May 28th. ARTHUR MILLER.

HEARING-AIDS FOR DEAFNESS

To the Editor of THE LANCET

SIR,—Your correspondent, Mr. L. T. Webb, asks in his letter of May 14th if the time has not arrived for an effort to be made to form a corporate body among the hearing-aid industry corresponding to the opticians. Actually a number of hearing-aid manufacturers have already joined together to form the Aural Society of Great Britain, the aims of which are (among others) to regularise methods of trading, to establish standards of performance of various hearing-aids, and generally to coöperate with the medical profession in the development and supply of hearing instruments. The Society is in its very early stages, and it is likely to be some time before all that Mr. Webb asks can be achieved, assuming that it is considered that this is the best method of procedure. Anyone desiring information about the Aural Society may obtain it from me at Amplivox House, 2, Bentinck-street, London, W.1.

I am, Sir, yours faithfully,

May 18th. A. EDWIN STEVENS.

To the Editor of THE LANCET

SIR,—With reference to the remarks contained in Mr. Webb's letter to your issue of May 14th, may I as a member of the council and ethical committee of the Institute of Surgical Technicians express the view that it would considerably clarify the present position in regard to the supply of hearing-aids, as well as surgical appliances generally, if the work of both the Institute of Surgical Technicians and the National Institute for the Deaf was more widely known.

The Institute of Surgical Technicians was formed some years ago with the object of establishing a roll of names of accredited technicians with whom surgeons might safely coöperate. The Institute to-day has some 250 members, among whom are numbered international authorities in every branch of surgical technicology. The standard required may be judged by the fact that the qualification for fellowship must include a twenty-year association with an accredited surgical instrument concern, during which for a set period the applicant must have held a position of responsibility, and be vouched for in writing by a practising member of the medical profession. The second category for membership, that of licentiate, necessitates the same qualifications as above, except that the period of association with an accredited surgical concern may be ten years. The nomination demands an undertaking to sign and abide by the conditions of a strict ethical code as laid down by the Institute, as well as a similar code established by the medical committee of the National Institute for the Deaf. In consideration of this procedure I think it may justly be suggested that any member of the medical profession may recommend his patients with complete confidence to members of the Institute.

To revert to hearing-aids, it might be justly pointed out that although I am personally in agreement with a 5 per cent. charge being made to cover batteries, postage, and the loan of the instrument, there are many concerns, such as my own, who do not impose such a charge, the only reason for this being that it would be difficult to introduce such a measure after generations of working to a set procedure. The question of compensation for wear and tear whilst an instrument is on loan is a particularly heavy item for those members of the industry who do not necessarily manufacture but have to purchase various types and makes of instruments to hold in stock. In many instances the instruments are damaged in transit, leather cases are soiled, and as the outcome of twenty years' careful study and experience on this point I am satisfied that it would become unprofitable to the average surgical instrument house to market hearing-aids ethically unless some compensation was allowed as recompense for such usages.

Nobody is more fully aware of the unsatisfactory position that exists in certain quarters to-day in the marketing of so-called deaf-aids than our own group, and it is for this particular reason that a number of reputable houses have come together with the common object of supporting the approved list published by the National Institute for the Deaf, in the hope that in doing so they will create a closer understanding and fuller coöperation with members of the medical profession.

I am, Sir, yours faithfully,

LESLIE V. K.-REIN.

Charing Cross-road, W.C., May 27th.

HISTOLOGY OF DIABETES INDUCED IN DOGS BY INJECTIONS OF ANTERIOR-PITUITARY EXTRACTS

To the Editor of THE LANCET

SIR,—In your issue of May 14th K. C. Richardson and F. G. Young reported very interesting results from the investigation of experimental permanent diabetes, induced in dogs by injections of crude anterior-pituitary extract. The importance of their experiments is beyond doubt. The permanent diabetes of young dogs corresponds to the human diabetes of acromegaly or gigantism, accompanied by oversecretion of the diabetogenic factor of the anterior pituitary. This is in close agreement with the results we have obtained in acromegaly associated with diabetes. We, indeed, found that the blood plasma freshly taken from an acromegalic patient and injected into rabbits caused high hyperglycæmia.[1]

One point in Richardson and Young's investigation remains, however, to be elucidated. The pancreases of dogs rendered diabetic contained no detectable islet tissue, whereas one dog which failed to become

[1] Elmer, A. W., Giędosz, B., and Schops, M., *C.R. Soc. Biol., Paris*, 1937, **125**, 1086; *Acta med. scand.* 1937, **93**, 487.

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permanently diabetic had islets of Langerhans normal in every respect.

In this connexion it is of interest to notice our own observation that in a dog (5·4 kg.) treated with daily intraperitoneal injections of acid anterior pituitary (prepared by us by L. Loeb's method) corresponding to 0·5–1·0 g. of dried substance per kg. body-weight, over a period of one month (100 g. of dried anterior pituitary), there appeared only in the first days of treatment a slight and temporary glycosuria and hyperglycæmia. The dog died nine days after the last injection of the extract with general extreme weakness and loss in weight. Though permanent diabetes had not been induced the islet tissue of the pancreas was found to be markedly atrophic. The thyroid showed signs of hyperfunction, but no striking histological change was apparent in the other endocrine glands (unpublished data). On the other hand, we found in young rats, guinea-pigs, and rabbits, injected with the same anterior-pituitary extract, an immediate rise in the blood-sugar, even up to 400 mg. per 100 c.cm. when a large dose (0·5–1·0 g. of dried anterior pituitary per kg. body-weight) was given intraperitoneally or intravenously. In spite of this striking diabetogenic activity of the anterior-pituitary extract, there was little change in the histological aspect of the pancreases of animals treated for 4–6 days, as shown in our papers.[1] The question arises whether the changes in the islet tissue are due to the activity of the diabetogenic or of the thyrotropic hormones, both contained in crude anterior-pituitary extracts. Since Houssay, Biasotti, and Rietti [2] have established that the diabetogenic effect of the anterior pituitary is independent of the condition of the islets, it appears to us that the changes in islet tissue found by Richardson and Young and by ourselves are most probably linked with the activity of the thyrotropic hormone.—We are, Sir, yours faithfully,

A. W. ELMER,
B. GIEDOSZ,
M. SCHEPS.

Institute of General and Experimental Pathology of the University of Lwów, Poland, May 23rd.

PARLIAMENTARY INTELLIGENCE

DETENTION OF MENTAL DEFECTIVES

IN the House of Commons on May 30th Mr. ELLIOT, Minister of Health, in moving the second reading of the Mental Deficiency Bill, said that the necessity for this Bill arose out of a decision of the Court of Appeal. The case turned upon a very narrow point—namely, the interpretation of Section 11 of the Mental Deficiency Act 1913. The Act said that an order should expire at the end of one year unless continued under certain procedure, and the Board of Control considered they had a right to regulate their procedure. For many years the Board, acting on legal advice, had proceeded on the view that, provided they had concluded the consideration of the special reports and certificates and had satisfied themselves in due time that the continuation of the order was required, the final sealing and issuing of the order might be done administratively with such reasonable delay as was unavoidable. That view was upheld by a Divisional Court of the High Court, but the decision was reversed by the Court of Appeal.

THAT EXTRA MONTH

The Government had come to the conclusion that one month's latitude should be allowed as set out in this Bill. This latitude allowed reasonable time for consideration of the report and for making up the Board's mind. The Bill also validated orders which had been invalidated by the previous assumption.

Mr. RHYS DAVIES said that the Labour Opposition did not intend to oppose the Bill, but they would like to know whether in fact the Bill did not increase the power of the Board to detain persons in institutions and enable them to do things which they could not do at present.—Mr. MOREING said that there was a tendency now to take the view that the erring of juvenile delinquents was due to mental deficiency and to treat such persons under the Mental Deficiency Act instead of handing them over to the jurisdiction of magistrates. That was having an increasing effect on the number of people being certified for treatment under the Act.—Mr. LOGAN said that he had seen some of these cases lately and in most of them the Board of Control was doing a wonderful work, but he was doubtful whether in general the Board exercised the supervision which was essential for the welfare of the individuals placed under their care. The individual who was taken into a mental institution should stage by stage have his condition certified and at the end of the twelve months it should be possible to know exactly what his condition was. Twelve months was long enough to detain anybody without certification.

Sir FRANCIS FREMANTLE pointed out that in regard to patients being sent to an institution always for a year there was a definite provision that the Board might direct the order to expire on the quarter day next after the admission, so that they had the power to limit detention to three months. A patient could be detained after twelve months only when two practitioners, including one chosen by the defective, his parent or guardian, or any relative or friend, had made an examination, and considered that it was in the interests of the patient that the order should be made. Therefore it was not a case of wrongful detention under the present law as long as the Board of Control were doing their job. This Bill was an administrative requirement. It was quite natural that the administration might from time to time overstep the mark at the end of the twelve months, and in such cases it was advisable to allow the further month. This would not interfere in any way with the patient's release.—Mr. EDE said that local authorities and others had of late years tried to persuade people to go into mental institutions on the plea that it would be for only a limited period, and that a short stay would probably prove completely effective. It was very undesirable that anything should be done which might make the period of detention any longer. The Board should collect the papers earlier, so that the decision might be announced within the period for which the certificate ran.

Sir DONALD SOMERVELL (Attorney-General) said it had been thought best, in the interests of the patient, to extend rather than to shorten the time for the medical officers' reports required for the annual review. If they put the date back, the medical officer would have to submit the report roughly a month sooner. Under the present scheme, the Board would have a certain latitude for exceptional cases and for the final making of orders. The reports of the medical officers would come in after the Bill was passed on the same dates as at present, so that in normal cases the whole thing could be disposed of before the end of the quarter day. There was no reason why a patient should not be released as soon after the Bill was passed as he would now. The extra month, which the Board had no intention of using for delay, would enable the Board to deal with exceptional cases and give them time for the necessary administrative procedure. Replying to Mr. Logan, Sir Donald added that the Board had full power under the Bill to discharge a patient at any intermediate date. There was the further

[2] Houssay, B. A., Biasotti, A., and Rietti, *C.R. Soc. Biol., Paris*, 1932, 108, 479.

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safeguard, in addition to the annual and quinquennial reviews, that every case was reviewed by the visiting justices at the age of 21. Where there was a possibility of recovery there was no reason to believe that the recommendations of the visitors under the local authority would not be acted on as promptly under this Bill as hitherto.

NOTES ON CURRENT TOPICS

Incurable Insanity as Ground for Divorce

ON May 24th, when the Divorce and Nullity of Marriage (Scotland) Bill was further considered by a standing committee of the House of Commons, Miss HORSBRUGH moved to omit subsection 2 of the clause which provides :—

"In any action of divorce on the ground of incurable insanity the defender shall not be held to be incurably insane, unless it is proved that he is, and has been for a period of five years immediately preceding the raising of the action, under care and treatment as an insane person, and where such care and treatment as aforesaid is proved the defender shall, unless the contrary is shown to the satisfaction of the court, be presumed to be incurably insane."

Was it possible under this subsection, she asked, to prove that insanity was curable ? Could an action be brought again after five years, and if it was shown to the satisfaction of the court that there was the probability of a cure, could a further action be brought in another two or three years ? Was it a case of try and try again ? She asked hon. Members to consider whether they were doing a just thing to a defender who was deprived of his freedom. Not only were they going a great deal further than the English Act by putting the onus of the defence on to the insane person, but there was a further provision in the English Act as to wilful neglect or misconduct which might have conduced to the insanity. They were taking away the safeguards of the English Act.

Mr. MACQUISTEN said that this clause had arisen out of the practical working of the English Act in which the burden of proof was upon the party who was seeking divorce. It had been found that the medical profession in England was not prepared to say that any person was incurably insane. If that was so, it showed that incurable insanity was based on a fallacy.

Mr. JOHNSTON said that more than the safeguard of medical testimony was needed. Was it possible for the Secretary of State to satisfy himself personally, before an action for divorce on these grounds could be taken, not only that the Board of Control had given them information but the social and domestic circumstances of the case were such that no hardship could possibly occur?

Mr. T. M. COOPER, Lord Advocate, said that in actions for divorce on the ground of insanity a curator *ad litem* would be appointed. As to the meaning of the words "unless the contrary is shown," if the medical evidence showed that the probabilities of recovery were no greater and no less than in any other case of five years continuing insanity, the presumption of incurable insanity would hold. If, on the other hand, the medical evidence could adduce any assignable reason for alleging that recovery within a definite period was more probable than in the general run of cases, the contrary would be proved and the presumption would be set aside. The amendment would, in his judgment, make the Bill, if not a dead letter, entirely unworkable, and from that standpoint he felt that the committee would do well to reject it.

The amendment was negatived and the Bill was ordered to be reported to the House.

Nursing-homes in Scotland

On May 31st a Standing Committee of the House of Commons considered the Nursing Homes Registration (Scotland) Bill. A clause moved by Sir Douglas Thomson, to exempt from registration nursing-homes conducted in accordance with Christian Science principles, was withdrawn on the understanding that it would be reconsidered before the report stage.

The Bill passed through Committee and was ordered to be reported, with minor amendments, to the House.

In the House of Lords on May 30th the Sheffield Infirmary and Hospital Bill was read the third time and passed. In the House of Lords on May 31st the Street Playgrounds Bill passed through Committee, and the Housing (Rural Workers) Amendment Bill was read a second time.

QUESTION TIME

WEDNESDAY, MAY 25TH

Industrial Contributions to Hospitals

Mr. ROBERT GIBSON asked the First Lord of the Admiralty whether he was aware that the success of the new scheme for the collection of contributions for hospitals fund at the Royal Naval Torpedo Factory at Greenock would be imperilled if 5 per cent. or more of the sums collected was used up in expenses by central machinery and deducted from funds receivable by Greenock Royal Infirmary and other local institutions; and whether he would take steps to see that the funds collected locally at Greenock went direct from the torpedo factory to the local hospital institutions without deduction, thereby ensuring that the torpedo factory workers in Greenock received the maximum benefit from their contributions.—Mr. DUFF COOPER replied : The scheme for the collection of contributions to local hospital funds by means of deductions from wages is designed to benefit the maximum number of institutions and provides for the transmission of the sums collected to a committee of the British Hospital Contributory Schemes Association who will undertake the distribution to the appropriate hospital funds. I regret that exceptional treatment cannot be given in the particular case referred to by the hon. Member.—Mr. GIBSON : Is the right hon. gentleman keeping in mind the fact that he himself expressed the view in this House in answer to a question by me on July 21st last that it was desirable to ensure that hospitals which were of benefit to the Royal Naval Torpedo Factory, Greenock, should have earmarked to them contributions made at Greenock; and will the right hon. gentleman look into the matter again, so that the men's wishes with regard to the allocation of the fund shall be taken into consideration ?—Mr. DUFF COOPER : I am quite prepared to look into the matter again, but I am afraid that it would not be possible to make any exception to the general rule whereby this scheme is run as one scheme covering all the hospitals concerned.

Civilian Medical Officers at R.A.F. Recruiting Depôts

Sir REGINALD BLAIR asked the Secretary of State for Air what were the conditions of service and emoluments of the civilian medical officers employed at the recruiting depôts in the large cities; and whether the memorandum, dated March 17th, 1938, had received consideration.—Sir KINGSLEY WOOD replied : Civilian medical practitioners employed at Royal Air Force Recruiting Depôts receive an inclusive salary of £500 a year. Two officers in receipt of retired pay are paid at special rates. Appointments are on a non-pensionable basis and are subject to one month's notice on either side. I am giving consideration to the memorandum referred to by my hon. friend.

Blood Test in Paternity Cases

Mr. SORENSEN asked the Home Secretary whether his attention had been drawn to the employment of a blood test in a recent legal case involving the question of paternity; and whether, in view of the acceptance of this test by the court, he proposed to take any steps to encourage or discourage the practice in similar cases.—Mr. GEOFFREY LLOYD, Under-Secretary, Home Office, replied : My right hon. friend has seen newspaper reports about this case. There has never been any doubt that if

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each of the parties to affiliation proceedings is willing to submit to a blood test evidence as to its results is admissible; and the publicity given to the recent case will, it is hoped, make the possibilities of the test more widely known to magistrates and others concerned. Legislation would, however, be required to make blood tests compulsory in cases of dispute as to paternity, and my right hon. friend can hold out no prospect of introducing legislation on this subject.

THURSDAY, MAY 26TH

Mark IV Respirators

Mr. HOPKIN asked the Home Secretary if he was aware that, up to the end of 1937, 66 per cent. of the deaths due to silicosis in the South Wales coalfield, 65½ per cent. of the totally disabled, and 70 per cent. of the partially disabled cases, occurred in the anthracite coal districts; and, in view of this, what was the reason for the delay in issuing Mark IV respirators; and what immediate steps he proposed to take to deal with this problem.—Mr. GEOFFREY LLOYD replied: My right hon. friend is fully alive to the importance of having supplies of such respirators available at an early date and he is glad to learn that various difficulties which arose as to materials and otherwise have been overcome and that the arrangements for supplying the manufacturers with requirements for production are now well advanced.—Mr. JAMES GRIFFITHS: Will the hon. gentleman consider trying these respirators experimentally in one colliery first; and will he bear in mind the fact that various medical men in this country are of the opinion that the use of these respirators ought to be carefully checked?—Mr. LLOYD: I am aware that the question is a very important one. For years it was impossible to make a respirator which was capable of resisting silica dust, but there has been a committee of the Medical Research Council and the respirator authorities and they are now fully satisfied that a solution has been achieved.—Mr. GRENFELL: Does not all the information available point to the fact that the real remedy lies not in respirators but in the suppression of dust?—Mr. LLOYD: The prevention of silicosis is a matter for the Mines Department.

Burning Pit-heaps and Public Health

Mr. TINKER asked the Minister of Health if he was aware that the health committee of the Manchester City Council had decided to get powers to experiment with a smokeless zone in one part of the city, as they were of opinion it would be beneficial to the health of the people; and would he consider giving powers to local authorities to control burning pit-heaps by establishing smokeless zones in the same way.—Mr. ELLIOT replied: I am aware that the Manchester public health committee have had this matter under review, but I have not been informed of the specific proposals in contemplation or the powers which they may think it necessary to seek. As regards the second part of the question, arrangements have been made for my Alkali inspectors, in conjunction with the inspectors of the Mines Department, to visit the burning pit-heaps and to explore the practicability of abatement and prevention. It is doubtful whether legislation would facilitate the solution of this problem.

Typhoid Outbreak at Hawick

Captain ELLISTON asked the Secretary of State for Scotland what steps were being taken to control the outbreak of typhoid fever at Hawick, in Roxburghshire; and whether the cause of the outbreak had yet been ascertained.—Mr. COLVILLE replied: From the beginning of the outbreak the local public health authorities, in coöperation with the Department of Health for Scotland, and the local practitioners, have used every means of dealing with the outbreak, of preventing its spread and of ascertaining its cause. Ample hospital accommodation for typhoid patients has been secured by bringing into use two buildings not normally utilised for cases of infectious disease. The necessary bacteriological work involved in such an outbreak has been carried out, first in the bacteriological department of Edinburgh University, and later in a special laboratory established in Hawick. As a measure of precaution the local water-supply is being chlorinated, though it has been established that the water-supply was not the vehicle of infection. Inhabitants of Hawick have also been advised to boil all milk and water. All contacts have been forbidden to handle foodstuffs. The lending library and the public swimming pool have been closed, and for a short time the public baths were also closed. In the course of the examination into the cause of the infection, exhaustive tests of the milk-supply and of the source and distribution of all foods in common use were made, and all employees engaged in production and distribution were where necessary subjected to special tests. As a result, the cause of the outbreak had been narrowed down to certain foodstuffs and it is believed that most, if not all, of the sources of infection have been cut off.

Milk Pasteurisation

Mr. ROSTRON DUCKWORTH asked the Minister of Health whether any conversations had yet taken place with representatives of local authorities with regard to the suggested legislation under which they were to have power to decide whether or not there should be compulsory pasteurisation of milk sold in the area under their control; and, if not, whether he proposed to have such consultations.—Mr. ELLIOT replied: Yes, Sir. My Department and that of my right hon. friend the Minister of Agriculture and Fisheries are in consultation with representatives of the associations of local authorities concerned.

Water-supplies

Mr. CHORLTON asked the Minister of Health whether he would state the progress made by the special committee appointed to investigate the water position in this country as to the amount, relative quantity in each area, and facilities of supply; and if he would give a table of districts in which no public supply was available.—Mr. ELLIOT replied: I would refer my hon. friend to the Year Book of the Inland Water Survey Committee published on May 11th. As regards the second part of the question, no public water-supply is available in one borough, and 11 rural districts. The following is the list: Borough of Eye,* rural districts of Broadwoodwidger, Holsworthy, Knighton, Launceston, Lodden, Mitford and Launditch,* Newton and Llandiloes, Painscastle, Smallburgh,* Swaffham, and Twrcelyn.*

Insulin Treatment of Mental Disease

Mr. RICHARDS asked the Minister of Health to what extent insulin treatment of certain types of mental disease on the lines so successfully pursued by Dr. Manfred Sakel, of Vienna, was employed in the public mental hospitals of this country.—Mr. ELLIOT replied: Insulin treatment is being applied in some 12 public mental hospitals in this country.

Taxation of Patent Medicines

Mr. CHATER asked the Secretary to the Treasury whether, in view of the interest taken at the present time in the question of the taxation of patent medicines, he would arrange for the report of the Select Committee on Patent Medicines, published in 1914, to be reprinted, in order that Members of Parliament and the public might be fully informed on this subject before legislation on this matter was brought forward in next year's Finance Bill.—Captain EUAN WALLACE replied: A copy of this report, which was reprinted in 1936, is available to hon. Members in the library, and a stock remains available through the Stationery Office.

MONDAY, MAY 30TH

Ex-Service Men and Mental Treatment

Mr. TINKER asked the Minister of Pensions if, when evidence was submitted by an applicant for pension in which it was stated that the ex-Service man's condition was due to some extent to his war experience acting on his mind, his department called in a psychologist to assist in determining the case.—Mr. H. RAMSBOTHAM replied: In every case in which an applicant produces evidence to show that his mind has been affected by his war service an expert in mental diseases is consulted.

* The local authorities for these areas have submitted applications for loan sanction for schemes of public supply.

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TUESDAY, MAY 31ST

Mortality-rate for Disability Pensioners

Viscountess ASTOR asked the Minister of Pensions how many deaths occurred amongst ex-Service men in receipt of disability pensions during the twelve months ended March 31st, 1938, or the latest period of twelve months available; and if he would state the mortality-rate for disability pensioners during that period and the comparative rate for civil males of the same age-groups.—Mr. H. RAMSBOTHAM replied: The number of deaths of disability pensioners in the year ended March 31st last was 7576, their mortality-rate being 17·9 per 1000. For the general male population of corresponding ages in England and Wales the mortality-rate for the same period was approximately 13 per 1000.

Medical Examination of Mental Deficients

Mr. THOMAS HENDERSON asked the Secretary of State for Scotland if he was aware that the Scottish Board of Control refused the right of the parents of a person certified by the Board as a mental deficient and an inmate of an institution under the authority of the Board to have an independent medical examination of such certified person; and would he instruct the Scottish Board of Control to grant an independent examination on application being made.—Mr. COLVILLE replied: Mental defectives are not certified by the General Board of Control, but the Board have a statutory duty to review at stated intervals the cases of all certified defectives. On such occasions the Board may obtain a report by one or more independent medical men, and they are bound to order the discharge of a patient at any time if they are of opinion that he is not, or is no longer, a defective. A parent or guardian may apply in writing to the Board for the discharge of any defective on the ground that his mental condition does not justify further detention, and the Board may, if they think fit, require the applicant to produce a medical certificate in support of the application. I am not aware of any case in which the Board have refused to comply with the statutory provisions, but if particulars of any specific case are furnished I will have inquiry made.

Anthrax in Angus

Mr. WESTWOOD asked the Minister of Agriculture how many cases of anthrax were reported in the last report of the medical officer of health for the county of Angus under the Contagious Diseases (Animals) Act, 1894, and the Anthrax Order of 1928; and in how many cases were the sources of infection traced.—Mr. RAMSBOTHAM replied: During 1937 22 outbreaks of anthrax in Angus, in which 29 animals were affected, were reported by the county authority, and the number reported in the first quarter of 1938 was 12 outbreaks affecting 13 animals. Eight of the 1937 outbreaks, and three in the March quarter of 1938, were probably due to the farms having been infected on previous occasions. The source of infection in the other cases was not definitely traced, but it may possibly have been associated with the use on these farms of artificial feeding stuffs which in 14 cases were known to have been imported from abroad.

MEDICAL NEWS

University of Oxford

Dr. A. M. Cooke has been reappointed May fellow and reader in medicine for a further three years from Oct. 1st, 1938. Dr. A. G. Gibson has been appointed Litchfield lecturer in medicine.

University of Cambridge

On May 28th the following degrees were conferred:—

M.D.—A. W. Williams, R. M. Bolam, and J. H. Cyriax.

M.B., B.Chir.—*M. C. Hounsfield, D. C. Lavender, G. R. C. Peatfield, and R. D. Holloway.

M.B.—*G. D. Wedd. * By proxy.

Dr. R. A. McCance has been appointed to the newly created readership of medicine in the university. This appointment has been established in place of the assistant directorship of research which Dr. J. F. Brock has lately vacated to take up the chair of medicine in the University of Cape Town. Except for a small amount of teaching Dr. McCance will devote his whole time to research and to the supervision and direction of biochemical research in the department of medicine. He will also collaborate in the work in the wards.

Dr. McCance, who is thirty nine years of age, was educated at St. Bee's School, Cumberland, and saw service during the late war as an aeroplane pilot with the Grand Fleet. He went to Sidney Sussex College, Cambridge, in 1919, and after taking both parts of the natural sciences tripos, worked for three years as a research student in the school of biochemistry under Sir Gowland Hopkins. In 1925 he was appointed demonstrator of biochemistry at King's College Hospital, London. He took a Ph.D. degree at Cambridge in 1926, qualified in medicine in 1927, and graduated as M.D. two years later. At this time he was elected to the Pinsent-Darwin research studentship at Cambridge, which he held while working as assistant biochemist at King's College Hospital. In 1932 he was appointed biochemist; in 1934 he became junior physician to the hospital with charge of biochemical research, and in the following year he was elected F.R.C.P. Lond. His Goulstonian lectures of 1936, which appeared in our columns, reviewed the medical problems of mineral metabolism—a subject to which he has made a number of original contributions, mainly by experimental work on himself and other volunteers. Dr. McCance has always devoted a very large part of his time to research and he has been part author of three special reports to the Medical Research Council on the composition of English foodstuffs. He has also worked on the physiology of cerebro-spinal fluid.

Chadwick Lecture

On Thursday, June 9th, at 5 P.M., Prof. E. J. Salisbury, F.R.S., will give a public lecture for the Chadwick Trust at the Chelsea Physic Garden, Swan-walk, S.W. He will speak on plants in relation to the human environment. Further information may be had from the secretary of the trust, 204, Abbey-house, Westminster.

University of London

On Tuesday, June 14th, at 5 P.M., Prof. C. H. Best, F.R.S., will give a lecture at University College, Gower-street, W.C. He will speak on heparin and thrombosis, and the lecture will be open to the public.

University of Edinburgh

On Friday, June 10th, at 5 P.M., Prof. C. Heymans, from the department of pharmacology of the University of Ghent, will deliver a lecture on some aspects of blood-pressure regulation and experimental arterial hypertension. On Thursday, June 16th, at 5 P.M., Prof. J. B. Collip, F.R.S., who has been awarded the Cameron prize for 1937, will lecture on results of recent studies on anterior-pituitary hormones. Both lectures will be given in the anatomy lecture theatre, University New Buildings, Teviot-place, and students and graduates are invited to attend.

Joint Tuberculosis Council

At a meeting of the council held on May 21st at the rooms of the Society of Medical Officers of Health, Dr. S. Vere Pearson, who presided, welcomed Dr. N. Lloyd Rusby and Dr. R. L. Midgley as new members, representing the Tuberculosis Association and the tuberculosis group of the Society of M.O.H.'s. The resignation of Dr. F. G. C. Blackmore was accepted with regret and Dr. W. Brand was coöpted a member of the council.

No additional committees were set up, but it was decided that the artificial pneumothorax (convener, Dr. W. W. Traill), employment (convener, Dr. J. B. McDougall), radiology (convener, Dr. G. Jessel), milk (convener, Dr. C. O. Hawthorne), gold (convener, Dr. R. L. Midgley), nursing (convener, Dr. Esther Carling), and the finance and publicity committees should remain in office. The committee dealing with work in the colonies becomes the "overseas" committee (convener, Dr. F. Heaf). A discussion on Memo. 37/T was initiated by Dr. G. Lissant Cox, who moved that the Ministry of Health be asked to resume the publication of the summary of returns of work. The returns at present available did not allow of comparison between areas of similar size and population. Dr. Jessel reported the coöption of four outside radiologists on the radiology committee. Dr. Brand reported Dr. Peter Edwards's offer to give two post-graduate courses, June 27th–29th and Sept. 26th–28th. Further post-graduate classes are to be arranged in November at Heatherwood and Brompton Hospitals.

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London Hospital

The sum of £46,000 has been received in support of the £300,000 scheme for extensions and improvements by which it is hoped to mark the bicentenary of this hospital. The gifts received include 200 guineas from Queen Mary, who is a president of the hospital, and £10,000 from Lord Nuffield.

Kent County Mental Hospital, Maidstone

On May 27th Mr. Walter Elliot, the Minister of Health, opened the new admission hospital and convalescent villas at this institution, which will provide 125 more beds and special facilities for new and early cases. The admission hospital includes a special treatment unit for the overhaul of physical condition. Mr. Elliot said that there was a changing public attitude toward mental disorder. To-day we looked upon it rightly as an illness, like any other. Even now there was far too much gloom in the minds of some of the public. It should be realised that one-third of the patients admitted were discharged recovered.

International Red Cross Conference

The sixteenth International Red Cross Conference will be held in London from June 20th to 25th. The Duke of Gloucester will open the first session at St. James's Palace at noon on June 20th. The conference will consider new principles dealing with war in the air, and it will be proposed that the Geneva and Hague conventions should be merged so that land, sea, and air warfare will be dealt with in a single code of laws. A plan for the creation of neutralised hospital zones, in war areas, sponsored by the International Congress of Military Medicine will also be discussed. Other subjects on the agenda include the function and activity of the Red Cross in time of civil war, first aid on the roads of the world, the standardisation of the size of bandages and other materia medica, and the future of air ambulances. Further information may be had from the secretary of the British Red Cross Society, 14, Grosvenor-crescent, London, S.W.1.

British Orthopædic Association

The Spring meeting of this association was held on May 27th and 28th, Friday being spent at the country branch at Stanmore of the Royal National Orthopædic Hospital, and Saturday at the Wingfield-Morris Hospital, Headington. There was a large overseas contingent and on Thursday evening a dinner was given at Grosvenor House to welcome members of the Scandinavian Orthopædic Association, who had been hosts themselves the previous year. After the reading of papers on Friday morning the Robert Jones gold medal and prize was presented to Mr. H. Jackson Burrows. In the evening members and associates dined together at the Langham Hotel, Mr. Naughton Dunn again presiding. In proposing the toast of the Association Mr. H. S. Souttar paid tribute to the memory of Sir Robert Jones "to whom," he said, "you owe the creation of this great association, and the position orthopædic surgery holds to-day." Mr. Dunn, in reply, recalled the first Spring meeting in February, 1918, when Muirhead Little was president. He had in his hand letters from Osgood and Goldthwait, both of whom were present on that occasion, congratulating the association on coming of age. He had himself, he said, been present, with one exception, at every meeting. The association now had more than 100 full members and as many associate members. Mr. Harry Platt proposing the Guests indulged his passion for classification by dividing them into three well-defined groups, the third being the Scandinavian contingent to which he offered hearty and affectionate welcome. "They have," he said, "been here before"; and Prof. Walderström, replying for the Norsemen, admitted a previous invasion some centuries ago. Their present vigour was demonstrated by the forcefulness of the "Hura!" with which they acknowledged the toast. Among those present were Dr. H. Nilsonne, Dr. F. Therkelsen, Dr. E. Platou, Prof. Maffei, Dr. J. Walderström, Dr. V. S. Staermose, Dr. Ivar Palmer, Dr. Svante Orell, Dr. Monberg, Dr. Sven Kiaer, Dr. N. H. Lindström, Dr. Walter Risinger, Dr. Guildal, Prof. Poul Morville, Dr. Odelburg-Johnson, and Mr. S. Friberg. On Saturday afternoon there was a clinical demonstration at Oxford by Prof. G. R. Girdlestone and his associates, followed by tea at St. John's College, a visit to Blenheim Palace, and a farewell dinner at New College.

Out-patient Time-table for London Voluntary Hospitals

King Edward's Hospital Fund for London has just issued the May edition of the out-patient time-table to all doctors in the London area. The object of the time-table is to prevent, as far as possible, patients attending out-patient departments on the wrong day or at the wrong time. Further copies are obtainable free from the publishers, Messrs. George Barber and Son Ltd., 23, Furnival-street, E.C.4.

National Association for the Prevention of Tuberculosis

The twenty-fourth annual conference of this association is being held at B.M.A. House, Tavistock-square, London, W.C., from June 30th to July 2nd. The subjects for discussion will include: the development and organisation of anti-tuberculosis activities in rural areas; the family and tuberculosis; the control of tuberculosis in tropical and sub-tropical regions; and the mental aspects of tuberculosis. Invitations to any of the sessions may be had from the secretary-general of the association, Tavistock House North, Tavistock-square, London, W.C.1.

Institute for the Scientific Treatment of Delinquency

The sixth annual general meeting of the institute was held at British Industries House Club on May 26th, when the speakers were Mr. Norman Birkett and Mr. St. John Hutchinson. The report presented brought the account of the institute's activities up to the end of April and contained the welcome news that the waiting-list for the psychopathic clinic has been reduced satisfactorily by the appointment of a medical registrar. It is noted that attempted suicides are now less frequently referred to this clinic, their proper place being rather the ordinary psychiatric clinic. Of the 167 references during last year, 79 were for theft, 45 for sexual offences, and 14 for embezzlement, false pretences, or forgery. The week-end lecture course which followed the meeting was attended by medical men from 16 different parts of England, as far afield as Blackpool, Hull, Leeds, Liverpool, and York. Lectures were given by Dr. J. D. W. Pearce, Dr. Denis Carroll, and Mr. T. H. Marshall, University reader in sociology, and there was a general discussion on the disposal of delinquents. There has been some demand for a repetition and extension of this course.

King Edward's Hospital Fund for London

Addressing the general council of this fund on May 27th, the Duke of Kent, as president, said that in 1937 the London hospitals increased their total income by about £350,000. But expenditure also rose and the result was a very small margin of about £8000 to the good, on a turnover of over £4,500,000. This was better than in 1936, when there was a small aggregate deficit for the first time since 1926. But it was not nearly enough; for the number of hospitals with deficits had increased, and a good deal of desirable expenditure had had to be deferred. Yet the fact remained that since 1926 the aggregate income of the London hospitals had increased from a little over £3,000,000 to well over £4,000,000, and that the total receipts for capital and maintenance had grown to £5,000,000, including more than £2,600,000 in voluntary gifts and over £1,000,000 contributed by patients. The personal efforts and sacrifices entailed were worth while. For there were great advantages in having the two kinds of hospital, the voluntary and the municipal, influencing each other and coöperating to form a complete hospital service; the voluntary hospitals emphasising the values associated with freedom, elasticity, and personal initiative, and the municipal hospitals the values associated with large-scale work and centralised administration under a public authority. So that their contribution to this dual hospital service might be effective, the voluntary hospitals were trying to do two things: to increase their income, and to combine the advantages of organisation with those of freedom, by means of voluntary coöperation.

Sir Edward Peacock, the treasurer, said that the income of the King's Fund was slightly larger in 1937 than in either of the two previous years. The distribution was £302,000, for which purpose £3700 was taken from reserves.

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National Physical Laboratory

Prof. R. H. Fowler, F.R.S., Plummer professor of applied mathematics in the University of Cambridge, has been appointed director of the laboratory in succession to Prof. W. L. Bragg, F.R.S., who has been elected to the Cavendish professorship of experimental physics in the University of Cambridge.

St. John Ambulance Brigade

Last year 2381 new members joined the brigade and 151 new divisions were created. The total membership has risen to 84,419, and the total number of cases for the year was 688,823. Over 9500 accidents were dealt with by members on Coronation day alone and 216 roadside huts and 1148 first-aid posts have been maintained and voluntarily staffed during 1937. The motor ambulances of the brigade also report increased activity and many members are taking part in A.R.P. work.

Appointments

ALLAN, ALASTAIR, M.B. Glasg., D.P.H., Assistant Medical Officer of Health for Greenock.

LAIRD, S. M., M.D. Glasg., D.P.H., Venereal Diseases Officer for Stoke-on-Trent.

LLOYD, OSWALD, M.B. Lond., Obstetric and Gynæcological Registrar at the Middlesex Hospital.

NORRISH, R. E., F.R.C.S. Eng., Hon. Assistant Surgeon to the South Eastern Hospital for Children, Sydenham.

OAKLEY, W. G., M.D. Camb., M.R.C.P. Lond., Physician with charge of out-patients to the Dreadnought Hospital, Greenwich.

WALTERS, J. O., M.R.C.S. Eng., House Surgeon at the Royal Waterloo Hospital, London.

WOOLF, ERNEST, M.R.C.S. Eng., Assistant Resident Medical Officer at Walton Sanatorium, Chesterfield.

King Edward Memorial Hospital, Ealing.—The following appointments are announced :—

LAURENT, L. P. E., M.D., M.R.C.P. Lond., Consulting Physician ;

PASSE, E. R. GARNETT, F.R.C.S. Eng., D.L.O., Second Consulting Laryngologist ;

TALBOT, G. G., M.B. N.Z., F.R.C.S. Eng., Ophthalmic Surgeon ;

ACHESON, HECTOR, M.B. Belf., Hon. Anæsthetist ; and

MAYALL, R. G., M.R.C.S. Eng., Hon. Anæsthetist.

Royal Aberdeen Hospital for Sick Children.—The following appointments are announced :—

CRAIG, JOHN, M.B. Aberd., M.R.C.P. Edin., Senior Hon. Physician ;

WALKER, E. R. C., M.B., F.R.C.P. Edin., Senior Assistant ; and

GORDON, IAN, M.B. Aberd., M.R.C.P. Lond., Second Assistant.

Medical Referees under the Workmen's Compensation Act, 1925 : B. R. SWORN, M.B., F.R.C.S., of Stone, Staffordshire, for the Stafford, Lichfield, Tamworth, and Uttoxeter County Court Districts (Circuit No. 26). Dr. V. E. BADCOCK, of Cornhill-on-Tweed, for the Berwick-upon-Tweed County Court District (Circuit No. 1).

Vacancies

For further information refer to the advertisement columns

Aberdeen Royal Infirmary.—Sen. Cas. O. in Out-patient Dept., £200.

Albert Dock Hosp., E.—Res. Surg. O. for Fracture Clinic, £250.

Ashton-under-Lyne, District Infirmary.—Cas. H.S., £180. Also H.S., at rate of £150.

Aylesbury, Royal Buckinghamshire Hosp.—Jun. Res. M.O., at rate of £150.

Bangor, County Hosp.—Cons. Surgeon and Cons. Physician, each 100 guineas. Also Part-time Med. Supt., £200.

Barnsley, Beckett Hosp. and Dispensary.—Jun. H.S., £150.

Barry U.D.C.—Surgeon for Accident and Surgical Hosp., £800.

Birmingham City.—M.O. for Casualty Service, £500

Birmingham City, Maternity and Child Welfare Dept.—Temp. M.O., £10 weekly.

Birmingham, Dudley-road Hosp.—Physician, £650.

Birmingham United Hosp.—Psychologist for Nerve Hosp., £500.

Bolingbroke Hosp., Wandsworth Common, S.W.—Hon. Physician.

Bolton Royal Infirmary.—Asst. Res. Surg. O., £200. Also two H.S.'s, each £150.

Boston General Hosp.—Res. M.O., at rate of £150.

Brighton Sanatorium and Infectious Disease Hosp.—Jun. Res. M.O., at rate of £250.

Brighton, Sussex Eye Hosp.—H.S., at rate of £150.

Brighton, Sussex Maternity and Women's Hosp.—Res. H.S., £130.

Bristol General Hosp.—Cas. H.S., at rate of £100. Also H.P.'s, H.S.'s, Res. Obstet. O., and H.S. to Spec. Dept., each at rate of £80.

Bristol University.—Professorship of Pathology, £1000. Also Lecturer in Pathology, £400–£500.

British Empire Cancer Campaign, 11, Grosvenor-street, S.W.—Med. Sec. and Reg., £500.

Burton-on-Trent General Infirmary.—Cas. O. and H.P., £150.

Calcutta, All India Institute of Hygiene and Public Health.—Prof. of Biochemistry, &c., Rs.1200 a month.

Cambridge, Addenbrooke's Hosp.—Res. Anæsthetist and Emergency Officer, at rate of £130.

Canterbury, Kent and Canterbury Hosp.—H.S., at rate of £125.

Cardiff, King Edward VII Welsh National Memorial Assn.—Asst. Res. M.O. for South Wales Sanatorium, £200.

Central Middlesex County Hosp., Acton-lane, N.W.—Res. Asst. M.O., £400.

Charing Cross Hosp., W.C.—Asst. Obstet. Phys.

Cheltenham General and Eye Hosp.—H.P. and two H.S.'s to Spec. Depts., each £150.

Children's Hosp., Hampstead.—Res. M.O., at rate of £150.

Connaught Hosp., Walthamstow, E.—Res. Surg. Reg. and Cas. O., at rate of £200 and £110 respectively.

Derbyshire County Council.—Asst. County M.O.H., £700.

Derbyshire Education Committee.—Asst. School M.O., £500.

Dewsbury and District General Infirmary.—Second H.S., £150.

Dreadnought Hosp., Greenwich.—H.P. and H.S., each at rate of £110.

East Ham Memorial Hosp., Shrewsbury-road, E.—H.S. to Spec. Depts. and Cas. O., at rate of £120.

Elizabeth Garrett Anderson Hosp., Euston-road, N.W.—Hon. Asst. Physician. Hon. Asst. Psychiatrist to Out-patient Dept. Also Med. Reg., £100.

Evelina Hosp. for Sick Children, Southwark, S.E.—Aural Surgeon, 50 guineas.

Folkestone, Royal Victoria Hosp.—Sen. and Jun. H.S.'s, at rate of £150 and £120 respectively.

Gloucestershire Royal Infirmary, &c.—H.P., at rate of £150.

Golden-square Throat, Nose, and Ear Hosp., W.—Hon. Asst. Surgeon. Also Clin. Assts.

Grimsby and District Hosp.—Res. Orthopædic Officer, £225.

Halifax Royal Infirmary.—Res. Surg. O., £250. Also H.P., £175.

Herefordshire General Hosp.—H.P., £100.

His Majesty's Colonial Service.—M.O.'s in Tropical Africa or Malaya.

Hosp. for Women, Soho-square, W.—Hon. Clin. Assts. to Surgeons in Charge of Out-patients. Also Res. M.O., at rate of £100.

Hull Municipal Maternity Home and Infants Hosp.—Jun. Res. M.O., at rate of £100.

Ilford, King George Hosp.—H.S., at rate of £100. Also two Hon. Asst. Physicians and Hon. Psychologist.

Ipswich, East Suffolk and Ipswich Hosp.—H.S. to Orthopædic and Fracture Dept., £144.

King Edward Memorial Hosp., Ealing.—H.S., at rate of £150.

Kingston County Hosp.—Res. Asst. M.O., at rate of £250.

Lancaster Royal Infirmary.—H.S., at rate of £130.

Leicester City Mental Hosp., Humberstone.—Locum Tenens Asst. M.O., 8 guineas per week.

Leigh Infirmary, Lancs.—Jun. H.S., at rate of £150.

Lincoln County Hosp.—Jun. H.S., at rate of £150.

Liverpool, Hahnemann Hosp., Hope-street.—Res. M.O., at rate of £120.

Liverpool Hosp. for Consumption and Diseases of the Chest.—Res. M.O., £150.

Liverpool University.—Two Lecturers (ungraded) in Dept. of Pathology, £400–£500 and £300 respectively.

London County Council.—Res. Med. Supt., £950. Also Asst. M.O.'s (Grade II), £250.

London Hosp., E.—Med. First Asst. and Reg., £300.

London University.—University Chair of Radiology, £1500. Also Examinerships.

Maidstone, Kent County Ophthalmic and Aural Hosp.—Ophth. H.S., at rate of £200.

Manchester, Ancoats Hosp.—Chief Asst. O. to Orthopædic Dept., £150.

Manchester Royal Children's Hosp., Pendlebury.—Asst. M.O. to Out-patients' Dept., at rate of £150.

Manchester Royal Infirmary.—Jun. Asst. M.O. in Radiological Dept. and Chief Asst. to Neuro-surgical Dept., each £350. Also Res. Jun. M.O. for Barnes Convalescent Hosp., at rate of £150.

Manchester, Victoria Memorial Jewish Hosp., Cheetham.—Jun. H.S. and Cas. O., and Res. M.O., at rate of £125 and £150 respectively.

Metropolitan Hosp., E.—Surgeon.

Middlesbrough Education Committee.—School Dental Surgeon, £450.

Middlesbrough, North Riding Infirmary.—Sen. H.S., £175. Also Third H.S., at rate of £140.

Mountain Ash Urban District Council and Education Committee. Asst. M.O.H., &c., £500.

National Temperance Hosp., Hampstead-road, N.W.—H.P., at rate of £100.

Newcastle-upon-Tyne Eye Hosp.—Hon. Ophth. Surgeon.

Northampton General Hosp.—Res. Anæsthetist, at rate of £150.

Norwich, Norfolk and Norwich Hosp.—H.S., £120.

Putney Hosp., Lower Common, S.W.—Res. M.O., £150.

Queen's Hosp. for Children, Hackney-road, E.—H.P., at rate of £100. Also Ophth. Surgeon and Vacancy in Dept. of Psychological Medicine.

Rainhill, Lancs, County Mental Hosp.—Asst. M.O., £550.

Redhill County Hosp., Edgware.—Jun. Res. Asst. M.O., at rate of £250.

Richmond Institution, Surrey.—Res. Asst. M.O., at rate of £250.

Romford, Oldchurch County Hosp.—Asst. Res. Surgeon, £350.

Rotherham Hosp.—Sen. H.S., £200.

Royal London Ophthalmic Hosp., City-road, E.C.—Out-patient Officer, £100.

Royal Naval Medical Service.—M.O.'s.

Royal Northern Hosp., Holloway, N.—H.S., at rate of £70.

St. Albans, Herts, Hill End Hosp.—H.P., at rate of £165.

St. Helens Hosp., Lancashire.—Sen. H.S., £225.

St. Mark's Hosp. for Cancer, &c., City-road, E.C.—H.S., at rate of £120.

St. Mary's Hosp. for Women and Children, E.—Res. Surg. O. and Res. H.P., at rate of £155 and £150 respectively.

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St. Paul's Hosp. for Urological and Skin Diseases, Endell-street, W.C.—H.S., at rate of £100.
St. Peter's Hosp. for Stone, Henrietta-street, W.C.—Clin. Assts. to Hon. Staff.
Salford, Hope Hosp.—Res. Obstet. O., £400.
Salford Royal Hosp.—Two H.S.'s, each at rate of £125.
Sheffield, Jessop Hosp. for Women.—Sen. Res. Officer and H.S., at rate of £150 and £100 respectively.
Sheffield Royal Infirmary.—Clin. Asst. to Ophth. Dept., £300. Also Ophth. H.S., at rate of £150.
Southampton Borough General Hosp.—Asst. Res. M.O., £350.
Southampton, Royal South Hants and Southampton Hosp.—Res. Anæsthetist and Cas. O., each at rate of £150.
Sudan Medical Service.—Vacancy, £E720.
Sunderland County Borough Mental Hosp.—Med. Supt., £1000.
Taunton and Somerset Hosp.—H.P. and H.S., each £125.
Tilbury Hosp.—H.S., at rate of £140.
Warneford Hosp., Oxford.—Physician Supt., £1000.
West London Hosp., Hammersmith, W.—Two Cas. O.'s, each £250. Also H.P. and two H.S.'s, each at rate of £100.
Westminster Hosp. Annexe, 66, Fitzjohn's-avenue, Hampstead.—Radiologist.
Weston-super-Mare Hosp.—Res. H.P., £150.
Willesden General Hosp., Harlesden-road, N.W.—Cas. O., at rate of £100. Also Hon. Clin. Assts. to Out-patient Dept.
Windsor, King Edward VII Hosp.—H.S., at rate of £120.
Wolverhampton Education Committee.—Asst. M.O., £600.
Wolverhampton Royal Hosp.—H.S. and H.P., each at rate of £100.
Wood Green and Southgate Hosp., Bounds Green-road, N.—Second Hon. Gynæcological Surgeon.

The Chief Inspector of Factories announces a vacancy for a Certifying Factory Surgeon at Horncastle (Lincoln).

Medical Diary

June 6th to June 12th

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
FRIDAY.
Ophthalmology. 5 P.M. (cases at 4.30 P.M.), annual general meeting.
Laryngology and Otology. 9.30 A.M. (Victoria Infirmary, Glasgow), Dr. A. W. Proetz: Nasal Physiology in Sinus Surgery. Mr. A. Bowen-Davies: The Paranasal Sinuses in Children. Prof. D. F. Cappell: The Pathology of Naso-pharyngeal Growths with special reference to Lympho-epithelioma. Mr. F. C. W. Capps: Lympho-epithelioma in the Nasopharynx.
SATURDAY.
Laryngology and Otology. 9.30 A.M. (Victoria Infirmary), Mr. Philip Scott: Eighth Nerve Tumours. Mr. T. O. Howie: The Otologist's Part in the Investigation of Suspected Brain Tumours. Mr. W. Stirk Adams: A Fatal Case of Otitic Cerebellar Abscess with Contra-lateral Petrositis. Dr. Dohlman (Lund, Sweden): The Mechanism In Vestibular Irritation.

RESEARCH DEFENCE SOCIETY.
THURSDAY.—3 P.M. (London School of Hygiene, Keppel-street, W.C.), Prof. C. H. Best, F.R.S.: Insulin and Diabetes—the Present Position. (Stephen Paget lecture.)

MEDICAL SOCIETY OF INDIVIDUAL PSYCHOLOGY.
THURSDAY.—8.30 P.M. (11, Chandos-street, W.), Dr. R. A. Noble: Psychiatry and the Community.

SOUTH-WEST LONDON MEDICAL SOCIETY.
WEDNESDAY.—9 P.M. (Bolingbroke Hospital, Wandsworth Common, S.W.), Mr. Zachary Cope: The History of the Surgical Treatment of Abdominal Disease. (Bolingbroke lecture.)

BIOCHEMICAL SOCIETY.
SATURDAY.—2.30 P.M. (department of medical chemistry, University, Edinburgh), short communications.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

UNIVERSITY OF LONDON.
TUESDAY and THURSDAY.—5 P.M. (University College, Gower-street, W.C.), Prof. B. P. Babkin: The Physiology of the Digestive Glands.

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane-road, W.
TUESDAY.—4.30 P.M., Dr. H. Gardiner-Hill: Diseases of the Ductless Glands.
WEDNESDAY.—Noon, clinical and pathological conference (medical). 2 P.M., Dr. Janet Vaughan: The Action of Certain Poisons on the Blood. 3 P.M., clinical and pathological conference (surgical). 4.30 P.M., Prof. J. C. Drummond, D.Sc.: Practical Aspects of Modern Vitamin Research.
THURSDAY.—2.15 P.M., Dr. Duncan White: radiological demonstration.
FRIDAY.—2 P.M., clinical and pathological conference (obstetrics and gynæcology).
Daily, 10 A.M. to 4 P.M., medical clinics, surgical clinics and operations, obstetrical and gynæcological clinics and operations.

ST. MARY'S HOSPITAL, W.
TUESDAY.—5 P.M. (Institute of Pathology and Research), Sir Henry Dale, F.R.S.: Chemical Agents Transmitting Nervous Excitation.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL, S.W.
THURSDAY.—5 P.M., Dr. Anthony Feiling: neurological demonstration.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY.—2 P.M., Mr. James Crooks: Recognition and Treatment of Sinus Infection in Children. 3 P.M., Dr. W. G. Wyllie: Nephritis in Children.
Out-patient clinics daily at 10 A.M. and ward visits at 2 P.M.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY to SUNDAY.—BROMPTON HOSPITAL, S.W., Tues. and Fri., 5.15 P.M., M.R.C.P. course in chest diseases.—NATIONAL TEMPERANCE HOSPITAL, Hampstead-road, N.W., Tues. and Thurs., 8 P.M., clinical and pathological M.R.C.P. course.—LONDON CHEST HOSPITAL, Victoria Park, E., Wed. and Fri., 6 P.M., M.R.C.P., course in heart and lung diseases.—CITY OF LONDON MATERNITY HOSPITAL, City-road, E.C., Sat. and Sun. course in obstetrics.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James' Hospital, Ouseley-road, S.W.
TUESDAY.—4 P.M., Dr. C. P. Symonds: The Clinical Significance of Headache.

Births, Marriages, and Deaths

BIRTHS

ARMSTRONG.—On May 23rd, at Folkestone, the wife of Dr. Reay Armstrong—a daughter.
HOLMES.—On May 27th, the wife of Surg.-Comdr. J. G. Holmes, R.N. Hospital, Haslar—a son.
RAEBURN.—On May 29th, the wife of Dr. H. A. Raeburn, Gills Hill, Radlett, Herts—a daughter.
SAVIN.—On May 24th, at the Stock Exchange Private Block, King's College Hospital, the wife of L. H. Savin, M.D., M.S., F.R.C.S.—a daughter.
STEELE-PERKINS.—On May 24th, the wife of Dr. Guy S. Steele-Perkins, Exeter—a son.

MARRIAGES

KENT—TAYLOR.—On May 28th, at Christ Church, Crouch End, Alfred Raymond Robert Kent, M.R.C.S., to Elsie Grace Taylor, elder daughter of Mr. Augustus S. Taylor, of Highgate.
PARISH—KEARY.—On May 21st, at Romsey Abbey, Hants, T. N. Parish, M.D., to Margaret L. Keary, of Weymouth.

DEATHS

COOPER.—On May 24th, at Leicester, Arthur Tanner Cooper, M.R.C.S. Eng., aged 69 years.
HARPER.—On May 30th, at Bath, John Maurice Harper, Lt.-Col. and Hon. Surg.-Col. R.A.M.C.(T.), retired, V.D., M.R.C.S. Eng., D.P.H.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED MAY 21ST, 1938

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 2006; diphtheria, 1110; enteric fever, 15 (30 "expected"); pneumonia (primary or influenzal), 1336; puerperal pyrexia, 203; cerebro-spinal fever, 35; acute poliomyelitis, 3; encephalitis lethargica, 2; dysentery, 36; ophthalmia neonatorum, 110. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on May 27th was 4420, which included: Scarlet fever, 841; diphtheria, 1009 (carriers 46); measles, 1282; whooping-cough, 272; puerperal fever, 19 mothers (plus 9 babies); encephalitis lethargica, 283; poliomyelitis, 4. At St. Margaret's Hospital there were 29 babies (plus 14 mothers) with ophthalmia neonatorum.

Deaths.—In 126 great towns, including London, there was no death from small-pox or enteric fever, 26 (10) from measles, 1 (1) from scarlet fever, 17 (1) from whooping-cough, 26 (1) from diphtheria, 29 (8) from diarrhœa and enteritis under two years, and 66 (10) from influenza. The figures in parentheses are those for London itself.

Fatal cases of measles were reported from 13 great towns, Hull, Manchester, Newcastle-on-Tyne, and West Hartlepool each having 2 deaths. Birmingham reported 5 deaths from whooping-cough. Diphtheria was fatal in 17 great towns, Liverpool reporting 5 deaths, Hull 3.

The number of stillbirths notified during the week was 305 (corresponding to a rate of 42 per 1000 total births), including 41 in London.

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NOTES, COMMENTS, AND ABSTRACTS

TRAFFIC IN NARCOTIC DRUGS

Russell Pasha, in his report on the work during 1937 of the narcotics bureau of the Egyptian Government, records with satisfaction the progress made since 1929 in coping with the traffic in dangerous drugs. The work of the bureau was vigorously directed in the first place to exposing and curtailing the international traffic as contemplated by the several opium conventions, and secondly to raising the price by reduction of the supply of narcotic drugs to the people of Egypt. The world's supply of contraband heroin, it is stated, still comes from the Far East and passes through Suez en route for Europe and America. An illicit heroin factory was raided in Athens and heavy sentences of imprisonment passed upon the traffickers who had formerly been expelled from Egypt. Illicit cultivation of hashish in Syria gives rise to anxiety as it is the narcotic mostly consumed by the fellahin. Russell Pasha is sceptical as to so-called "cures" of addicts, many of whom he holds "are not like 'other folk,' but rather are members of an emotionally unstable and personally inadequate group for whom little of permanent character or of social value can be accomplished."

A valuable study of the present position of the opium-smoking habit in India by R. N. and G. S. Chopra is reported in the *Indian Medical Gazette* for April. It recalls that opium-smoking, always looked down upon in India, was unknown there before the nineteenth century. It spread from China where opium-smoking had followed on tobacco-smoking which had been introduced in the latter part of the sixteenth century. The conclusions of the Drs. Chopra confirm those of previous observers—namely, that opium-smoking in excess leads to emaciation, general cachexia, lethargy, loss of will-power and of economic efficiency. The opinion is vouchsafed that opium-smoking is more deleterious to the Indian than to the Chinese.

Meanwhile at Geneva the advisory committee on the traffic in opium and other dangerous drugs and the Permanent Central Opium Board continue to watch international traffic and carry into effect the provisions of the conventions of 1912, 1925, and 1931. Mr. Lyall (United Kingdom) has been re-elected chairman of the board and Mr. May (U.S.A.) vice-chairman. Seizures of raw and prepared opium, of morphine, heroin, and cocaine continue to be reported; notably seizures of heroin, prepared opium, and morphine in the Minneapolis area where heavy sentences of fines and imprisonment were passed on members of a notorious gang of traffickers.

ADOPTION DIFFICULTIES

PROBLEMS arising in the adoption of children were discussed at a meeting of the medical section of the British Psychological Society on May 25th. Miss S. Clement Brown said that while the number of legal adoptions had steadily risen since the Adoption Act was passed in 1926 they constituted only about one-third of the total adoptions, which amounted to 15,000 or more a year. The law, she said, provided opportunity for a careful study of the child and the adopting parents, but there was great variety in the thoroughness of such inquiries. At least two-thirds of the children adopted were illegitimate, and they were for the most part adopted by married couples of child-bearing age, of whom about two-thirds were childless. Dr. W. L. Neustatter thought the earlier adoption took place the better, if the child was properly safeguarded from the risks of early weaning. It was important to take the first opportunity of telling these children the truth about themselves; small children were acute observers and would readily sense an air of mystery about themselves. They would then feel themselves different, and this was one of the most potent causes of a sense of inferiority in childhood. Mrs. E. Norman mentioned among the conditions needed for success in adoption the willingness on the part of the adopting parents to accept the child for better or for worse, and the suitability of the adopting family in respect of (*a*) age of parents and siblings; (*b*) intelligence as compared with that of the child; (*c*) emotional stability. Failure in fulfilling these conditions had played a part in some of the cases referred to child guidance clinics. The adopted child might not so readily gain a sense of security in parental love. He might not so early learn to tolerate frustration from the adopting parents if he had built up an ideal of very different real parents. Some problems had apparently arisen through the child's attempt to lead the type of life—often antisocial—that he had heard attributed to the real parents.

HOMOPLASTIC GRAFTS

IN the journal *Médicine Expérimentale*, published by the Institute of Experimental Medicine of the Ukraine, Prof. M. G. Rouditzky gives a résumé of recent experiments with grafts of the endocrine glands (1938, No. 1, p. 28). He has previously reported work on suprarenal grafts in animals; he now turns his attention to human grafts, and contrary to what might be expected has obtained better results than when working with animals. He has also found that it is possible to preserve the vitality of grafting material for as long as 45 days if it is immersed in citrated blood at a temperature of 4° C. He is under the impression that these preserved grafts provoke less reaction in the tissues of the host than material immediately transplanted. Contrary to Voronoff's teaching, he finds that testicular grafts, both fresh and preserved, are absorbed very rapidly.

REPRODUCTIVE CONSEQUENCES OF BIRTH CONTROL

THE consequences of contraceptive instruction in private practice have seldom been reported in detail and a paper by Dewees and Beebe [1] is correspondingly welcome. The material studied consists of 884 private patients seen during the twelve-year period ending in 1936. A quarter came for advice before marriage; all were white women and most came from well-to-do homes (i.e., college-trained or the equivalent); and 94 per cent. were taught the use of diaphragm (Dutch cap) and jelly.

Dewees and Beebe were able to trace 662 of these cases, and it was found that 83 per cent. of those given diaphragm and jelly were still using the method. Of those who had abandoned it 24 per cent. had done so because they no longer needed protection against pregnancy. The remainder had discarded it for various other reasons, such as dislike of the method, lack of confidence in it, and actual failure. The authors point out that an acceptability-rate of 83 per cent. is reasonably high but that the 15–20 per cent. of dissatisfied patients present a special and difficult problem. They follow Raymond Pearl's plan for estimating the success or failure of the contraceptive technique, and give for comparison pregnancy-rates derived from studies [2] of women not using contraception or using self-taught methods, and from the patients under review before they received advice. When all pregnancies are taken into consideration the figures indicate that a minimum rate of 100 births for each 100 woman-years of exposure to pregnancy risk is to be expected when no contraceptives are used; and that a similar rate for patients using self-taught contraception varies

[1] Dewees, L., and Beebe, G. W., *J. Amer. med. Ass.* April 9th, 1938, p. 1169.

[2] Pearl, R., *Ibid*, 1937, **108**, 1385; Stix, R. K., and Notestein, F. W., *Milbank mem. Fd quart. Bull.* 1935, **13**, 162; Beebe, G. W., and Gamble, C. J., unpublished data.

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from 28 to 42. The figure for the women under review before they consulted Dewees or Beebe is 41, which indicates that some form of contraception was presumably being used by these patients before their first consultation. In all these series the rates are higher for first pregnancies than for second and subsequent pregnancies. The rate for the author's patients after instruction is 6, which represents a reduction of 93–96 per cent. in pregnancy risk. Alternatively, since 86 unplanned pregnancies were reported by the 622 cases followed up, it may be stated that the total failure-rate was in the region of 14 per cent.; but at least half of these failures are attributable to errors or omissions in technique. The average duration of exposure to pregnancy risk was 29 months and the average length of follow up was 39 months. In comparing the previous fertility of those who succeeded and those who failed a conspicuous difference was found; the former had a first-pregnancy rate of 69 and the latter one of 174 before their first consultation.

This paper contains evidence that the use of a cap and various spermicidal jellies (most of which were acid) does not retard conception after the method is set aside for a planned pregnancy. A total of 167 such pregnancies were reported to the authors, and in 136 of these the time required for conception to occur was known. It appears that 50 per cent. were conceived within a month, 76 per cent. within three months, and 90 per cent. within six months of ceasing to use contraceptives. Inasmuch as at least 40 per cent. of these women had used a diaphragm and jelly before their first pregnancy, these figures do not support the contention [3] that the use of caps and acid jellies from the beginning of marriage leads to sterility later.

TWO NEW STETHOSCOPES

THE Capac Co. Ltd. (80, Station-road, London, S.W.13), which has been making acoustic apparatus for over twenty years, has lately introduced two new forms of binaural stethoscope for which certain advantages are claimed.

There are two types of chest-piece. Type A consists of a plated end, convenient to hold, into which two forms of end-piece can be screwed. These are made of aluminium alloy. In one form the aperture is conical, in the other it is concave, giving a shallower air-space; the former is recommended for auscultation of the heart, the latter for listening to the respiratory sounds. Type B chest-piece has a small chamber with a diaphragm protected by a wire grating, inserted between the finger-grip and the end-piece, of which there are the same two forms as in type A. Two kinds of head-frame are also made by the Capac Company; one is a folding spring model, the other is a rigid form with a transverse spring and milled clamping nut. The ear-plugs are made of rubber and are comfortable in use.

All parts of these stethoscopes are well made and highly finished. We have submitted both types to a thorough test, and find them convenient and comfortable, conducting both cardiac and respiratory sounds well. The diaphragm form (type B) amplifies the sounds without distortion, and should be useful to those with impaired hearing.

YOGA

A CRITICAL account [4] of Indian mystical practice by a scientifically trained writer with first-hand knowledge of the self-discipline of Yoga will interest all sorts of people. Psychopathologists will find that the theory of the unconscious has affinities with deep Yogal states and that the death-instinct of Freud is allied to the denial of existence which Nirvana presupposes. The breathing exercises are worth considering in the light of theories of early oral erotism. The body postures described as health giving may well suggest additions to the scheme of exercises devised by physiotherapists to meet current demands. The theory of posture-breathing which cultivates a state of isolation from sense stimulation deserves the consideration not only of physiologists but of statesmen who may find in it a means of obtaining isolation from a distracted world.

[3] See *Lancet*, 1938, 1, 462, 517, 576.

[4] Yoga. By Kovoor T. Behanan, Ph.D., Institute of Human Relations, Yale University. London: Martin, Secker, and Warburg. 1937. Pp. 270. 10*s*. 6*d*.

HYPEROSTOSIS FRONTALIS INTERNA

ALTHOUGH the syndrome including frontal hyperostosis, virilism, and adiposity in women was described by Morgagni as long ago as 1761, the condition has only lately begun to attract much attention. G. G. J. Rademaker, who describes 5 cases under his own observation, states that up to 1900 only 50 had been reported (*Ned. Tijdschr. Geneesk.* 1938, 82, 2245). The characteristic sign of the disease is the deposition of bone on the inner aspect of the os frontale, which can be detected during life by X ray examination. The thickening is nodular on the surface and sometimes exceeds a centimetre in depth; it lies on either side of the median line, which remains free, so that a deep groove always divides the thickened area into two symmetrical halves. It consists of spongy bone, containing large numbers of osteoblasts; the underlying dura is usually thickened and firmly fixed to the bone.

Morgagni's syndrome is often associated with dementia and atrophy of the brain, but in only 1 of Rademaker's 5 cases were mental symptoms (delusions and a suicidal tendency) prominent; in the others the chief symptoms were attacks of headache and vomiting, though all these patients complained of loss of spirits and 2 of weakness of memory. Obesity was evident in 3, and 3 showed increased hair on the chin and upper lip. Similarly, disturbances of vision were met with in 3, and dizziness and signs of ataxia in the same number. The blood calcium was found in all 5 cases to be somewhat high, though within the limit of normal. Rademaker suggests giving a calcium-poor diet and injections of parathyroid extract. One of his patients was treated by operation (removal by trephine of part of the thickened area) and decided improvement followed.

THE AUTOBIOGRAPHY OF AN EXTRAVERT

THOUGH the dust-cover specifically calls his book [1] a doctor's autobiography, Dr. Dearden, inside, asserts that it is nothing of the kind. His idea, one gathers, was to show what curious things do occur in life, to be sure, and if the book seems autobiographical at times that is because so many of the curious things in it actually happened to him. Fortunately for us, he does not mind undressing in public, as he assures us before proceeding to disrobe; and if he sometimes yields to a natural impulse to retain a veil or two, these are apt to be so disarmingly transparent that he appears the more engaging for them. He has a trick of decrying in himself qualities which the rest of us would be pleased to announce as virtues. One of these deplorable tendencies was clearly of singular service to a nervous school-fellow who was afraid of the dark. His adventures demonstrate the advantage of being an extravert rather than an introvert, for in spite of the morbid broodings of his adolescence Dr. Dearden seems to have had the practical vigour and attack of the extravert in his composition from the word go. Some of his experiences could be matched by most doctors, but others are peculiar to himself: how many of us, for example, can claim to have performed with a travelling strong man or to have witnessed a Lancashire puncing match? But whether he is recounting strange things or adorning a quite ordinary tale Dr. Dearden is a good showman and keeps the reader's interest. And if his gusto is sometimes generously broad that is a characteristic which he shares with Shakespeare and Gracie Fields.

[1] The Wind of Circumstance. By Harold Dearden. London: William Heinemann. 1938. Pp. 351. 12*s*. 6*d*.

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ADDRESSES AND ORIGINAL ARTICLES

THE PURSUIT OF SHADOWS*

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THE danger of prophecy can hardly ever have been more strikingly demonstrated than when Charles Pearson wrote the final sentences of his book "National Life and Character" in 1893. Here was a highly educated and experienced man who anticipated a world becoming steadily quieter and duller. In every detail his expectations have been falsified and in none more than when he said that all the great scientific discoveries had already been made. For only two years later X rays were discovered and radium after about one year more. When Roentgen first gazed through a glass darkly he would have needed more than prophetic vision to have anticipated what we have seen since—the veil of the temple of orthodox physics rent in twain to reveal a changed conception of matter ranging from the macrocosm of the starry heavens to the microcosm within the atom; a clock by which to measure geological time, the philosopher's stone no longer the alchemist's dream. Surely no magician's crystal could have revealed greater wonders than these. When the public orator presented Marconi for his honorary degree at Cambridge he quoted happily from a Latin poet, "My room was filled with music and I knew it not." In many directions new forces were being released, the full powers of which we did not realise. That medicine should share in this renaissance was only to be expected; fortunately it shared to the full. And here may we pause for a moment and gratefully recall those pioneers who blazed a trail and fell in the adventure; the men who unharnessed these new forces and fell victims to them. Surely they deserve as well of their fellow men as those who perished amid antarctic snows or on mountain peaks. By their works you have entered into your kingdom securely and without fear.

Well I remember the announcement of that great discovery; the transient scepticism with which it was first received was speedily dispelled by the demonstration of actual photographs; I remember the first installation of X rays at St. Bartholomew's Hospital as a mere adjunct to the electrical department there by Dr. Lewis Jones. I remember Lockwood's sardonic prophecy that actions for malpraxis in the matter of the treatment of fractures would be multiplied by the discovery. I remember Hardy (later Sir William Hardy) taking me into a dark room and producing a small tube called a spintharoscope, wherein I saw stars and meteors emanating from radium. I remember the excitement of W. B. Cannon's first observations by a bismuth meal of the gastric movements of the cat's stomach; I remember the earliest attempts of Hugh Walsham to X ray the chest. But why should I take up your time over such jejune reminiscences when the January number of the *British Journal of Radiology* is enriched by Mr. Thurstan Holland's fascinating paper on Radiology in 1896, and by Mr. R. E. Roberts's admirable disquisition on "Our Heritage"? Also you will hardly expect me to recapitulate all the changes in medicine which have resulted from the introduction of X rays. Nor would you thank me for repeating the trite admonition physicians are fond of administering to radiologists that the interpretation of shadows is not the whole of diagnosis. Rather would I attempt to discover the changes which radiology has wrought in what I may term, for lack of a more accurate phrase, the philosophy of medicine.

PROGRESS OF MEDICAL THOUGHT

Though Harvey introduced the experimental method it was too far in advance of the medicine of his day to affect it, although the physiology of the next half century derived directly from his discovery. Clinical medicine rather followed the lead of Sydenham until the middle of the nineteenth century. Bright and Addison in England, Graves, Stokes, and Corrigan in Ireland were among the distinguished exponents of his method. I sense to-day a tendency among some leading physicians to deplore the increasing reliance on laboratory methods which are apt to dull clinical observation. There is truth in this—any examiner must lament the way in which the candidate refuses to form an opinion without such aids. Clinical observation was the method which in comparatively recent times recognised myxœdema, acromegaly, and Fröhlich's syndrome among other conditions. Yet we cannot but be surprised at the failures and delays of the unaided clinical method. Two centuries elapsed between Willis's discovery of a saccharine substance in the urine of diabetics and Kussmaul's observation that such patients were apt to develop air-hunger and to die in coma. Coronary thrombosis is a recent discovery, yet Prof. Ryle has found in John Hunter's account of his own case an accurate description of the symptoms and on turning to the record of the post-mortem examination of that great man he found evidence of an old thrombosis clearly described, without its significance being recognised. The liability of auricular fibrillation to occur in hyperthyroidism was not realised until the last decade. Obviously the method of unaided clinical observation has unexpected limitations. I am reminded of a remark that I once heard Sir James Paget make—when he heard of a new disease he turned to his note-books and found an unrecognised example of it there.

The first aid to clinical medicine to become established was morbid anatomy. Of this Bichat was the earliest but Virchow the most complete exponent. The influence of his cellular pathology was profound. No one can delve into the transactions of the old Pathological Society as I have done without realising the enormous mass of sound knowledge which was built up in this country on that foundation. But it had its limitations, of which we later became aware. It dealt with end-results and it led to a nihilistic attitude towards therapeutics. How could such profound changes, they asked, be prevented by a bottle of medicine?

The next aid to clinical medicine was the experimental method which was only fitfully followed after Harvey until the days of Ludwig, about the middle of last century. How comparatively recent this method is, is borne in on me by recollecting that one of my teachers, W. H. Gaskell, worked under Ludwig, and another of them, Lauder Brunton, was a joint author of the first text-book of practical physiology published in this country. The defects of both

* The Skinner lecture delivered before the British Association of Radiologists on Feb. 18th, 1938.

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of these methods were cleverly lampooned by the late Dr. F. G. Crookshank under the names of the mortuary and the veterinary schools of medicine. The limitations of the first I have indicated; those of the second he arraigned thus, "What is traced on a smoked drum is regarded as evidence—but what the patient says is not evidence." Whereas it really is evidence even if it is demonstrably untrue, because it reveals the patient's state of mind.

Next came the bacterial theory of disease, with its helpful corollaries of antitoxin and vaccines. The reverse of that picture was the failure to appreciate the importance of the soil and an over-stressing of the importance of the seed.

And so we reach the stage at which two entirely new methods came to our aid—radiology and biochemistry. Physiological chemistry we had long had with us—but here again it was end-products which were chiefly its concern. The change to biochemistry was more than a change of name—it implied a change of mental attitude—an attempt to estimate the chemical changes within the living cell—a change from a static to a dynamic position. And here I think we have the essence of the change wrought in medicine not only by biochemistry but also by radiology.

A TEAM OF THREE

The first Skinner lecturer, Dr. Hernaman-Johnson, last year in his closing remarks provided me with a point from which to start the discussion of that change. He said "Radiotherapeutics, if it is to progress, must not ally itself exclusively with surgery and physics but must look to medicine for guidance and more particularly to those branches of it which are known as endocrinology and biochemistry." I would extend that wise remark and apply it to radiology in general and illustrate it by a succinct example.

Generalised osteitis fibrosa cystica of the von Recklinghausen type had been recognised and adequately described radiologically for a good many years before endocrinology revealed the cause in a parathyroid adenoma. Radiology has led to the description of certain other types of widespread cystic conditions of bone, which I shall refer to in a minute, but it required the biochemist to establish the differential diagnosis between them and von Recklinghausen's type by means of calcium and phosphorus estimations of the blood. In this connexion I should like to refer to three interesting papers published by F. Albright last year in conjunction with various collaborators.

The first of these deals with minimal degrees of hyperparathyroidism. He maintains that many cases of this condition are missed because of the absence of skeletal symptoms and indeed of X ray signs. There is lassitude, colic, and nephrolithiasis, while the serum calcium is only slightly raised and the plasma phosphatase remains normal. For the recognition of the true nature of such cases it is necessary to take a number of other biochemical data into account, and also the calcium content of the renal calculus. Note the interesting sequence of events. First radiology recognises the condition; then endocrinology and biochemistry explain it. Then the clinician becomes able to detect it in a much earlier stage, but finally comes back to the radiologist to help him in proving the existence of the tell-tale calculus.

His second paper deals with a condition to which he has given the name of renal osteitis fibrosa cystica. Now for some years it has been known that chronic nephritis might have an effect upon the parathyroids. My attention was called to the subject by the case of a boy aged 4 when I first saw him, suffering from a remarkable type of familial nephritis. He died of uræmia at the age of 16 and post-mortem examination revealed that his parathyroids were about ten times the normal size. A study of the literature showed that if nephritis is sufficiently chronic, enlargement of the parathyroids not infrequently follows. According to H. A. Magnus and R. Bodley Scott, it is depletion of the calcium stores in the tissues which stimulates the parathyroids to a compensatory hyperplasia. F. S. Langmead and J. W. Orr writing on renal rickets associated with parathyroid hyperplasia expressed the belief that the honeycombing of the bones in this disease (apart from the rickety changes) is due to osteoclastic activity resulting from the secondary parathyroid activity. Here again we have some valuable observations linking radiology with endocrinology and the biochemistry of chronic nephritis.

Albright's third communication relates to a new syndrome, osteitis fibrosa disseminata, which may well be confused with, but must be distinguished from, that associated with hyperparathyroidism. It usually occurs in females. The characteristic features are (*a*) multiple bone cysts which have a distribution suggesting a relation to nerve-roots or to an embryological defect in the myotomes; (*b*) areas of pigmentation which have a distribution suggesting some connexion with the bone cysts; and (*c*) precocious puberty, though this has not been observed in the rare male cases. The bony manifestations differ from those of hyperparathyroidism in that they are spotty rather than generalised, but the main distinction is that there are no changes in calcium or phosphorus metabolism. I think this must be the same or allied condition as that described by Snapper of Amsterdam, in which the cysts are filled with lipoid material such as occurs in the liver in von Gierke's disease. He pointed out the prime importance of biochemical investigation before undertaking a roving commission among the parathyroids on radiological evidence alone.

When Prof. Snapper was recently in England I heard him make the somewhat perturbing statement that persons who had long survived an amputation of a limb for an alleged osteosarcoma were really merely the subject of an osteoclastoma and that a biochemical examination would have saved the limb. This implies that hyperparathyroidism may become quiescent, but in any case I think this series of cases fully confirms Dr. Hernaman-Johnson's advocacy for a close collaboration between radiology on the one hand and endocrinology and biochemistry on the other.

THE NEW OUTLOOK

I may now return to my main contention: that radiology like biochemistry has signalised a change from a static to a dynamic outlook. Life involves movement; it is a state of becoming rather than of merely being. Think for a moment what the teaching of anatomy was in our student days and compare it with what is happening in most schools to-day. As far as the viscera were concerned we were taught almost as much error as truth. For years the shape and position of the stomach was misconceived, for example. To-day the student sees on the screen the stomach as it is in life and activity; he learns its variability within the limits of normal, and we too have had to learn the wide variations in the position of the colon compatible with health and normal

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function. "Son of Man can these dry bones live?" How often I repeated those words as I dolefully studied them with Holden's "Osteology" by my elbow. To-day the student sees them living and moving on the fluorescent screen. How much more interesting and how much more informative.

Then think of the fascinating studies that have been made not only in the normal growth of bone but of the arrest of that growth by any intercurrent disease, so that we bear in our bones a recording angel of our past history. "The moving finger writes and having writ—" the record remains for all time, so that even a mummified Pharaoh exhumed from the Valley of the Kings tells us of the childish ailments he suffered from some thousands of years ago. "Nothing ever gets *quite* well" as Sir George Humphry used to tell us at Cambridge, wagging his long forefinger menacingly in our terrified faces, though he might have reassured us with equal truth as to the extraordinary capacity of the body to make readjustments nevertheless.

A further advance was made when it was realised that X rays could not only make growth manifest but could modify it. Here radiological and biological research were happily combined in the study of tissue cultures. Just as Loeb had previously induced parthenogenesis in sea-urchins' eggs by chemical means, so now it was found possible by irradiation of tissue cultures to influence the mitosis of cells. Interesting and valuable researches began to emanate from the Strangeways Laboratory at Cambridge and elsewhere. The optimum intensity of gamma rays for reducing mitosis in tissue cultures has been actually measured. The effects of irradiation in vitro and in vivo were found to be similar, though naturally the precise response of embryonic tissue varies according to the presence or absence of a blood-supply. This method of study was largely initiated by the urgent need for more exact knowledge of the way irradiation influenced the embryonic cells of malignant disease, and we must deplore the all too early death of R. G. Canti, by which we lost an ingenious and successful worker in that field. It may well be that before the problem of malignancy is solved some discovery will have to be made which breaks new ground as definitely as did in turn the discovery of micro-organisms, viruses, hormones, and vitamins. Still at the moment it is the radiological and the biochemical methods of approach which are offering the most hope.

STIMULANTS OF GROWTH

A great step forward was taken when the Needhams and Waddington showed that Spemann's "organisers" in the embryo are not cellular structures but chemical substances. The best known of these is the one which organises the first appearance of a central nervous system in the embryo. This is a sterol closely related chemically to œstrogenic compounds, which in their turn are closely related to carcinogenetic substances on the one hand and to bile acids and vitamin D on the other. This chemical relationship between various stimulants to normal growth and those to abnormal growth is both interesting and important.

Carcinogens can excite œstrus and œstrin can have carcinogenetic effects. Human skin heated to a very high temperature will yield a tarry substance which is as carcinogenetic as any derived from coal tar. A strongly carcinogenetic substance has also been synthesised by J. W. Cook from deoxycholic acid, a sterol in bile. Therein is a hint at the explanation of the known close association between gall-stones and cancer. Again, if fertilisation is delayed in amphibia, the organiser may escape from its proper site and set up teratomata capable of wide metastasis. This throws new light on the origin of the so-called "included twins." In this connexion it is interesting that Aschheim has found the gonadotropic hormone of pregnancy in the urine of patients suffering from a teratoma even in the case of a man. This may provide a test of real diagnostic value. The rôle of vitamin E in reproduction is also instructive. In its absence the embryo throws out a rapidly proliferating "lethal ring" of new growth, thus committing suicide by cutting itself off from its own food-supply. Here the vitamin appears to impose order on what would otherwise be a disorderly growth, just as vitamin D controls irregular ossification.

POTENTIALITIES OF IRRADIATION

From this collection of amazing facts two definite conclusions emerge: (1) the overlap between the activities of these various stimulants to growth is very considerable; (2) from sterols normally occurring in the body a deranged metabolism may produce specific carcinogenetic substances which will stimulate certain cells to wild proliferation. If the bombardment of metallic elements with gamma rays can change them into atoms of something else it is only likely that irradiation can affect the complicated structure of a sterol, since, as we already know, heat alone can change sterols normally present in the skin into an actively carcinogenetic substance. But exact knowledge of such difficult problems clearly calls for the combined efforts not only of the radiologist and the organic chemist but also of the biochemist, for it has been maintained that the end-result of radiation is a combined effect not only directly on tumour cells but also indirectly through the reaction excited in the tissues of the host. This latter effect is one which has a parallel in the action of various therapeutic drugs such as Salvarsan, and in the behaviour of antigens. Clearly there is an enormous field for research here. Meanwhile the physicist with his newly acquired power of producing artificial radio-activity may throw fresh light on these reactions. I should like to call your special attention to a recent paper by Mr. L. G. Grimmett in *Nature* visualising some of the possibilities arising therefrom with special reference to the behaviour of the neutron. He says:—

The neutron has peculiar and novel properties which may make it of particular value in radiation therapy. To mention only two: it is more heavily absorbed in the hydrogenous tissues of the body than in the bones, and it ionises by means of recoil protons which give densely ionised tracks, in striking contrast to the characteristics of X and gamma radiation, where absorption is roughly proportional to the density of the absorbing medium, and ionisation proceeds by means of thinly ionised recoil electron tracks. For these reasons alone, it might be anticipated that neutrons would produce different biological effects from X rays. Indeed the preliminary experiments of Lawrence and his collaborators on the effects of intense neutron beams on wheat seedlings, mouse tumours, and other living organisms, indicate that neutrons are more effective biologically than X rays, and what is perhaps more significant for therapeutical purposes, that they have a greater "selective action" than X rays; that is to say, they inflict relatively greater damage on malignant cells than on normal ones.

Artificial radio-elements have already proved their worth as chemical and biological indicators. Elements can be "labelled" by mixing with them a small quantity of a radio-active isotope, and their subsequent

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history traced through the most complicated chemical actions by means of the associated radio-activity. In this way, for example, the metabolism of calcium and phosphorus in the body of the rat has been studied.

Now that it is becoming possible to produce short-lived radio-active isotopes of the common elements in large quantities, measurable in millicuries, we may hope to extend the scope of chemotherapy by the use of radio-active organic compounds, the therapeutic action of which would depend on their radio-activity rather than on their chemical properties.

LIGHT FROM DARKNESS

If the production of artificially radio-active substances is full of therapeutical promise the diagnostic scope of radiology has already been enormously increased by the discovery of other radio-opaque substances besides bismuth and barium; compounds of the heavy halogens such as Opacol, Uroselectan, and Lipiodol, whereby a much more living presentment of the activities of the gall-bladder, kidney, and lung have been obtained. The last-named has not only clarified our ideas on bronchiectasis in general but has led to the recognition of dry bronchiectasis.

The story of its discovery bears re-telling. It was first used therapeutically for fibrositic pains. Sicard and Forestier taking an X ray picture of a hip-joint for suspected arthritis were surprised to see dark fan-shaped lines radiating inwards from the surface. Then they remembered that the patient had had an injection of lipiodol for the relief of pain the week before, and were quick to see the far-reaching implications of their discovery. I had the pleasure of seeing the original photograph of this when I visited their clinic in 1926.

It would indeed be difficult to mention a single medical subject of which our knowledge has not been extended by radiology, but I will not weary you with reciting a long list. It is not merely by the use of opaque substances that such advances have been made, for the introduction of air into the chest, the peritoneum, and even into the ventricles of the brain has also come to our aid. Indeed the radical advances in the early diagnosis and active treatment of pulmonary tuberculosis are largely due to the coöperation of radiology.

It is however germane to my particular thesis of the change from static to dynamic conceptions of disease to refer to the more vivid representations that the introduction of the cinematograph into radiology has made possible; a subject with which the name of Dr. Russell Reynolds is honourably associated. As to the harmful effects of irradiation on the tissues there is I think nothing I can add to the classical paper of my distinguished predecessor at Cambridge, Sir Humphry Rolleston.

* * *

On the staircase of the great hall of St. Bartholomew's Hospital is a large wall-painting by Hogarth of the Pool of Bethesda. Looking at it recently, with this lecture in my mind, I remembered the belief that the pool only had healing properties when from time to time an angel descended and troubled the waters. And it occurred to me that the healing pool of medical science was a little in danger of becoming stagnant in the last decade of the last century until it was stirred by Hertzian waves. Then the whole conception of matter was speedily changed. We know that this visible world presents a very different picture to our senses from that interpreted by the brain of a Rutherford. Reality and appearance, what a fruitful theme this has been for philosophers to play variations upon; what a puzzling problem for the students of objective science.

I am reminded of Plato's parable of the cave—he said, you will remember, that we are like men facing the wall in a cave so that all we could see were the shadows of things passing in the world outside; so wide was the gulf between reality and appearance. To-day we know that the gulf between the world as we see it and as we can analyse it yawns ever wider with every advance of science. Reflecting on Plato's parable it is interesting to see how the pursuit of the very shadows of shadows has illuminated and extended our conceptions of the real world. But though we pursue we shall never completely attain, yet there will be much satisfaction in the pursuit, for as Robert Louis Stevenson said "to travel hopefully is better than to arrive." Scientific curiosity is never satiated and it never palls. In your pursuit of scientific truth through shadows you will be like the figures on Keats' Grecian urn:—

> "Though winning near the goal—yet, do not grieve;
> She cannot fade, though thou hast not thy bliss,
> For ever wilt thou love, and she be fair!"

TREATMENT OF SPLENIC ANÆMIA AND BANTI'S SYNDROME

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THOUGH the term splenic anæmia was first employed by Griesinger and Gretzl (1866) for cases of anæmia associated with chronic splenic enlargement, the first systematic description of splenic anæmia as a pathological entity was given by Guido Banti (1883). Later he described the "symptom-complex and anatomo-pathological complex" which has since been known as Banti's disease (Banti 1894, 1898, and 1910). He divided the illness into three stages as follows:—

I. *Pre-ascitic stage* (*now usually termed "splenic anæmia"*).—Enlargement of the spleen, usually very great when discovered, is the presenting feature, and symptoms of anæmia follow. The red cells vary between 3 and 4 million per c.mm., the hæmoglobin being correspondingly low, so that the colour-index is about half. The white cells are not increased, and often there is a leucopenia. The liver may be enlarged at the end of this stage, which usually lasts 3–5 years but may be as long as 12 years.

II. *Intermediary stage.*—In this stage, usually lasting a few months but sometimes longer, gastro-intestinal disturbances set in and there may be hæmatemesis. The anæmia increases, the liver enlarges, but the spleen remains about the same size. The urine is diminished in amount and contains bile pigments and urobilin.

III. *Ascitic stage.*—Ascites appears, whilst the liver decreases in size and recedes behind the costal margin, and the anæmia becomes more pronounced. Death as a rule occurs within six months, usually from hepatic insufficiency or hæmatemesis.

Banti held that in its third stage the disease is indistinguishable from advanced portal cirrhosis of Laennec, and in its earliest phase from "splenic anæmia." He described the pathological changes in the spleen as constant and characteristic and claimed to have excluded all other causes of splenic

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enlargement, but many controversies have arisen since he wrote his original description, and there is much to support the view that so-called Banti's disease and splenic anæmia are but "clinical syndromes" which may have many different causes.

SCOPE OF THE INVESTIGATION

In the present investigation a survey was made of all cases diagnosed as splenic anæmia or Banti's syndrome admitted to the London Hospital from 1907 to 1935, and to the Cardiff Royal Infirmary from 1920 to 1937, many case records being rejected because of insufficient data. The clinical and post-mortem records of some fatal cases were analysed and most of the surviving patients were traced and reinvestigated. Altogether 129 cases were subjected to detailed scrutiny. No less than 35 failed to fulfil the requirements outlined above to establish the diagnosis of splenic anæmia or Banti's syndrome, and these were rejected. They included such conditions as acholuric jaundice, syphilis, primary thrombocytopenic purpura, malaria, Hodgkin's disease or lymphosarcoma, chronic hypochromic anæmia, and leukæmia.

This communication is based upon an analysis of the remaining 94 cases. Of these 51 were treated by splenectomy and 43 medically, the choice of treatment being largely a matter of opinion, so that the cases in each group are fairly comparable. The medical treatment consisted of symptomatic measures for anæmia, indigestion, pain, hæmatemesis, and so on, and for all practical purposes the cases so treated may be considered to have shown the natural progress of the illness.

Progress of the Anæmia under Different Forms of Treatment

According to the degree of anæmia the cases could be divided fairly evenly into three groups :—

Slight anæmia (30 cases).—Red cells over 4 million per c.mm. and hæmoglobin over 60 per cent.

Moderate anæmia (33 cases).—Red cells 2½ to 4 million per c.mm. and hæmoglobin 30 to 60 per cent.

Severe anæmia (31 cases).—Red cells less than 2½ million per c.mm. and hæmoglobin less than 30 per cent.

The degree of anæmia appeared to bear no relationship to the duration of the illness, but there was a striking relationship between the degree of anæmia and the occurrence of hæmatemesis. This symptom had been recorded in 25 of the 31 cases in the severe group, in only 12 of the 33 cases in the moderate group, and in no case in the slight group. Hæmatemesis appears then to be the most important factor in the production of anæmia, which in its absence is slight or moderate. In 28 cases the blood was examined only once because the patients died soon after admission or defaulted in attendance. More than one blood count was done in each of the remaining 66; the progress of the anæmia in the latter is set out below according to the form of treatment employed.

UNTREATED CASES

Observations have been obtained of 18 cases, grouped in accordance with the first blood count as severe anæmia 6, moderate anæmia 7, slight anæmia 5. Of these, 10 cases—4 slight, 3 moderate, and 3 severe—had a normal blood count when examined at periods varying from one to eight years after first coming under observation; 2 cases—both severe—had improved slightly when seen eight and twenty-three years respectively after the first examination; and 4 cases—3 moderate and 1 slight—showed no appreciable alteration in the blood count at intervals in 1 case of four months and in the others of one to four years afterwards. The remaining 2 cases—1 moderate and 1 severe—had become slightly more anæmic when examined three months and three and a half years later respectively.

As none of these had received treatment of any kind the observations suggest that in two-thirds (12 cases) the anæmia improves spontaneously with the lapse of time while in the other third (6 cases) there is no improvement.

IRON ONLY

Eleven cases were treated with iron, as Blaud's pill or iron and ammonium citrate, in doses from 40–90 grains daily, and of these only 3 failed to respond. One of the latter, a severe case, had had the condition for twenty-three years and was practically in the terminal stage before receiving iron. No explanation, however, can be given for the lack of response in the other 2, both moderate cases, in spite of perseverance with iron for over a year.

Eight cases—4 moderate and 4 severe—responded well and the blood counts became normal. The anæmia had been present for more than two years in all except 2, and 4 had previously had a hæmatemesis, which recurred and proved fatal in 1 case. In 5 of the 8 cases the response was immediate, but in the other 3 it was much slower. One, an advanced case which had been anæmic for twelve years following several hæmetemeses, showed no appreciable improvement until iron had been given for four months, and the blood count did not become normal until after another three months' treatment. The second patient had signs of cirrhosis of the liver and showed no improvement during the first three months' treatment with iron and the blood count did not reach normal until the end of nine months' treatment. In the third case the blood count did not become normal until the iron had been given continuously for two years, the probable explanation of the slow response being intercurrent attacks of severe hæmatemesis on two occasions. In all cases, however, once improvement set in it was continuous.

From these observations it appears that the anæmia responds to large doses of iron if given for a sufficient length of time in over 70 per cent. (8 cases) and in rather less than 30 per cent. (3 cases) iron has no effect.

SPLENECTOMY ONLY

Thirty-six patients who had been treated by splenectomy only were investigated. According to the pre-operative blood counts they were grouped as slight anæmia 12 cases, moderate anæmia 16, severe anæmia 8. The blood was again examined within a year after the operation in 10 cases and at intervals varying from one to four years in 13 cases, five to ten years in 10 cases, after thirteen years in 2 cases, and after sixteen years in 1 case.

In 14 cases (7 slight, 6 moderate, and 1 severe) the blood count had become normal. In 9 cases (4 moderate and 5 severe) although the blood count did not reach normal there was much improvement and in 1 there was slight improvement. Of the remaining 12, 9 cases (3 slight and 6 moderate) showed no appreciable change in the blood count, and 3 cases (2 slight and 1 severe) were definitely worse. Repeated hæmatemesis could explain the failure to respond in 1 of the latter, but in the other 2 no explanation was apparent.

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It thus appears that of cases treated by splenectomy the anæmia improves or disappears entirely in two-thirds (24 cases) and in the other third (12 cases) it is unaffected or gets worse.

SPLENECTOMY AND IRON

Only 1 case was treated with adequate doses of iron after having had the spleen removed.

This patient had suffered from repeated and alarming attacks of hæmatemesis since the age of fifteen, and although she was under observation no enlargement of the spleen was detectable until she was twenty-five, when she had another severe hæmatemesis. As she was still very anæmic—red cells, 2,680,000; hæmoglobin, 32 per cent.; white cells, 4200 (polymorphs 52 per cent., lymphocytes 37 per cent.)—her spleen was removed nine months later in the hope that this might accelerate recovery and prevent the recurrence of hæmatemesis. Three months after the operation her blood count showed red cells, 4,200,000; hæmoglobin, 65 per cent.; white cells, 10,000; and platelets, 243,000. Five years after the operation the number of red cells was normal but there was a definite iron deficiency: red cells, 5,390,000; hæmoglobin, 65 per cent.; white cells, 8000. In the following year she had another profuse hæmatemesis, causing a severe anæmia: red cells, 1,950,000; hæmoglobin, 21 per cent. Subsequent progress was slow and unsatisfactory, the blood count after nine weeks' treatment being still very low: red cells, 3,300,000; hæmoglobin, 27 per cent.; white cells, 5200; platelets, 395,000. Iron in full doses was given for the first time at this stage and the result was an immediate improvement, quite out of proportion to the progress observed after her previous hæmatemesis when iron had not been given. After only two months' treatment the blood count became normal for the first time in many years (red cells, 5,200,000; hæmoglobin, 90 per cent.; white cells, 6000) and this improvement has been maintained for the three years up to the time of writing.

TABLE I—PROGRESS OF THE ANÆMIA UNDER DIFFERENT FORMS OF TREATMENT

Degree of anæmia before treatment.	Untreated.			Splenectomy.			Iron only.		
	Imp.	No imp.	Total.	Imp.	No imp.	Total.	Imp.	No imp.	Total.
Slight ..	4	1	5	7	5	12	—	—	—
Moderate ..	3	4	7	10	6	16	4	2	6
Severe ..	5	1	6	7	1	8	4	1	5
Total ..	12	6	18	24	12	36	8	3	11

Imp. = improvement.

CONCLUSIONS BASED UPON THE PROGRESS OF THESE GROUPS

In about two-thirds of cases the anæmia improves spontaneously with the lapse of time and without treatment of any kind, and in about a third there is no improvement.

When treated with iron the anæmia, whether of long or short duration, improves in about 70 per cent. of cases; usually the response is immediate, but sometimes treatment must be continued for many months. The remaining 30 per cent. fail to improve even though the iron be administered in full doses for long periods. This lack of response can be attributed occasionally to the disease being in an advanced stage before beginning treatment, but in others no explanation can be found.

When treated by splenectomy only the anæmia improves or disappears altogether in about two-thirds of cases and in about a third it is unaffected or gets worse; the latter cases do not appear to differ clinically from those which improve, although recurrent attacks of hæmatemesis will explain the persistence of the anæmia in an occasional case. In one patient with a persistent anæmia due to a recurrence of hæmatemesis after splenectomy iron brought the blood count to normal in two months.

The results are summarised in Table I, from which it appears that as regards effect on the anæmia there is little to choose between the methods of treatment. It should be noted that the severe group showed the greatest percentage of improvement.

TABLE II—THE DURATION OF EACH STAGE IN CASES TREATED BY SPLENECTOMY AND THOSE TREATED MEDICALLY

Period under observation or the duration of life after beginning treatment.	Stage I.				Stage II.				Stage III.			
	Spl.		Med.		Spl.		Med.		Spl.		Med.	
	L.	D.	L.	D.	L.	D.	L.	D.	L.	D.	L.	D.
Years. Less than 2	1	6	3	3	2	2	3	5	1	9	..	4
2– 5	6	1	3	1	1	2	2	2	1	2	1	1
6– 8	2	2	4	..	1	1	1	1	..	..	1	..
8–10	5	..	1	..	..	..	1	..	1	..	..	..
13	1	..	..	..	..	1	..	1	1	..	1	..
16	1	..	..	1	..	..	..	1	1	..	..	1
23	..	..	..	..	..	..	1	..	..	..	..	..
Total	16	9	11	5	4	6	8	10	5	11	3	6

Spl. = splenectomy; Med. = medical. L. = living; D. = dead.

Comparison of Remote Results

EXPECTATION OF LIFE

The duration of life and the period under observation after starting treatment in the various stages of the illness in cases treated by splenectomy and in those treated medically, with or without iron, are shown in Table II. When these figures are analysed the following results are obtained:—

First stage.—Of 25 splenectomy cases observed for two years, 6 (24 per cent.) died during that period. Of 16 medical cases observed for two years 3 (19 per cent.) died during that period. One of the splenectomy cases died immediately as a result of the operation.

The numbers under observation at the beginning of the second year were 18 splenectomy and 10 medical cases; of these, 1 died in each group before the sixth year, thus giving broadly equivalent death-rates during that period. The numbers under observation at the beginning of the sixth year were 11 splenectomy and 6 medical cases; 2 of the splenectomy cases died but all the medical cases were alive at the end of the seventh year. At the beginning of the eighth year there remained 7 splenectomy cases and 2 medical cases, and all of these were alive at the end of the tenth year. After the tenth year there were 2 splenectomy cases and 1 medical case; 1 of the splenectomy cases was alive in the thirteenth year and the other was alive in the sixteenth year, whilst the medical case died in the sixteenth year.

Second stage.—Of 10 splenectomy cases observed for two years, 2 (20 per cent.) died during that period. Of 18 medical cases observed for two years 5 (28 per cent.) died during that period. One of the splenectomy cases died as a result of the operation.

The numbers under observation at the beginning of the second year were 6 splenectomy and 10 medical

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TABLE III—EFFECT OF TREATMENT UPON THE PROGRESS OF LIVER DISEASE AND OF ANÆMIA AT DIFFERENT STAGES

Stage.	No. of cases.			No improvement from treatment.							Improvement from treatment.					
		Treatment.		Splenectomy.				Medical.			Splenectomy.			Medical.		
	Total.	Splenectomy.	Medical.	Cases.	Post-operative death.	Others dead.	Living.	Cases.	Dead.	Living.	Cases.	Dead.	Living.	Cases.	Dead.	Living.
I.	41	25	16	11 (44%)	1	6	4	6 (37%)	5	1	14 (56%)	2	12	10 (63%)	—	10
II.	28	10	18	7 (70%)	1	5	1	11 (61%)	10	1	3 (30%)	—	3	7 (39%)	—	7
III.	25	16	9	11 (69%)	7	4	—	6 (67%)	6	—	5 (31%)	—	5	3 (33%)	—	3
Total	94	51	43	29 (57%)	9	15	5	23 (53·5%)	21	2	22 (43%)	2	20	20 (46·5%)	—	20

cases; of these, 2 splenectomy cases (33 per cent.) and 2 medical cases (20 per cent.) died before the sixth year. At the beginning of the sixth year there were 3 splenectomy cases and 6 medical cases; 1 patient in each group died before the eighth year. At the beginning of the eighth year there remained 1 splenectomy case, which died in the thirteenth year, and 4 medical cases; 1 of the medical cases was alive in the tenth year, 1 died in the thirteenth year, another died in the sixteenth year, and the remaining case was alive in the twenty-third year.

Third stage.—Of 16 splenectomy cases observed for two years, 9 (56 per cent.) died during that period. Of 9 medical cases observed for two years, 4 (44 per cent.) died during that period. The comparatively worse position of the splenectomy cases is due to the operative mortality (7 cases).

At the end of the second year the numbers under observation were 6 splenectomy and 5 medical cases; of these, 2 splenectomy cases (33 per cent.) and 1 medical case (20 per cent.) died before the sixth year. There were 3 splenectomy and 3 medical cases under observation at the beginning of the sixth year; of the splenectomy cases, 1 was alive in the tenth year, 1 in the thirteenth year, and 1 in the sixteenth year; of the medical cases 1 was alive in the eighth year, 1 in the thirteenth year, and 1 died in the sixteenth year.

This analysis suggests that the expectation of life in the different stages of the illness is little altered by splenectomy. If anything, the results appear to be slightly more favourable in the group of medical cases but this may be due to the operative mortality after splenectomy The analysis also shows that the cases in the various groups were observed for broadly equivalent periods and are therefore fairly comparable.

CAUSES OF DEATH

Of 51 cases treated by splenectomy 9 died as a result of the operation (operative mortality 18 per cent.). The immediate cause of death was post-operative thrombosis of the portal, splenic, and mesenteric veins in 3 cases; heart failure in 2; pulmonary embolism in 1; broncho-pneumonia in 1; hæmorrhage into the alimentary tract in 1; and septicæmia in the remaining case. Of these 9 cases 7 were in the ascitic stage, 1 in the second stage, and 1 in the first stage of the illness. The cause of death in the remaining 17 fatal cases treated by splenectomy was cirrhosis of the liver in 6 cases; hæmatemesis in 4; peritonitis in 2; intercurrent disease in 2; pyæmia in 1; and anæmia in 1; and in 1 case the cause was not clear.

Of the 21 fatal cases which received medical treatment only, cirrhosis of the liver was the cause of death in 10 cases; hæmatemesis in 9; and acute thrombosis of the portal and mesenteric veins in 1; and in 1 case the cause was not discovered.

The observations suggest that splenectomy does not arrest the progress of the liver disease nor abolish the risk of death from hæmatemesis, whatever the stage of the illness when treatment begins.

BENEFIT FROM DIFFERENT FORMS OF TREATMENT

The final results, based upon the progress of both the liver disease and of the anæmia, in cases treated by splenectomy and in those treated medically are analysed according to the different stages of the illness in Table III. This shows that 22 (43 per cent.) of 51 cases treated by splenectomy and 20 (46 per cent.) of 43 cases treated medically improved. The results according to the stage of the illness when treatment began were as follows: in the *first stage* 14 cases (56 per cent.) improved after splenectomy and 10 (63 per cent.) improved after medical treatment; in the *second stage* 3 (30 per cent. improved after splenectomy and 7 (39 per cent.) improved after medical treatment; in the *third stage* 5 (31 per cent.) improved after splenectomy and 3 (33 per cent.) after medical treatment.

Summary

An analysis of the results of treatment in 94 cases of splenic anæmia or Banti's syndrome shows that splenectomy does not improve the expectation of life, nor prevent the progress of the cirrhosis of the liver or of the anæmia, or the occurrence of hæmatemesis, and there is, therefore, no logical reason for retaining it as a routine. It may be justifiable to remove a spleen that is causing severe pain, but the operative risks must be considered.

Iron appears to be of value whether the patients have undergone splenectomy or not, but the anæmia is often unaffected by any form of treatment.

I wish to thank the honorary staff of the London Hospital and of the Cardiff Royal Infirmary for allowing me to investigate cases under their care and to publish these results. Most of the operations were performed by Sir James Walton of the London Hospital and Prof. A. W. Sheen of the Cardiff Royal Infirmary, who have generously placed their material at my disposal. In particular I wish to express my gratitude to Prof. A. M. Kennedy, Dr. Donald Hunter, and Dr. William Evans for their help and encouragement.

The London Hospital cases formed the basis of a thesis accepted for the M.D. degree by the University of London in 1934. From 1935 to 1937 the work

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was carried out in the medical unit of the Welsh National School of Medicine, during tenure of the Mrs. John Nixon research scholarship.

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CYCLOHEXYL-ETHYL-TRIAZOL IN THE CONVULSION TREATMENT OF SCHIZOPHRENIA

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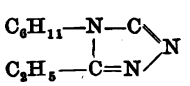
IN the treatment of schizophrenia by induced convulsions camphor was the agent first used, but its disadvantages soon led to its being superseded by Cardiazol (Metrazol), and all further work has been done with this substance. It is well known, however, that cardiazol too has certain drawbacks which are difficult to overcome. A bulky intravenous injection has to be given very rapidly; sclerosis of veins is common; and the subjects often have extremely unpleasant recollections of their experiences, leading to dread of or even active resistance to treatment. It seems worth while therefore to test other substances of related composition and known to have a similar general action to cardiazol, in the hope of finding a therapeutic agent free from these disadvantages.

The present paper is a preliminary report on the use of a compound of the triazol series, which was introduced last year as a cardio-respiratory stimulant by Behrens, Dinkler, and Woenckhaus [1] and was found to have advantages over Coramine and cardiazol for this purpose.

Chemically, the substance is 4-cyclohexyl 3-ethyl 1-2-4-triazol, and its formula is—



It is also known as Triazol 156 and under the trade name of Azoman. In this paper we shall refer to it as triazol.

It is readily soluble and the solution does not damage the tissues when given intramuscularly or subcutaneously. Its action, like that of similar analeptics, is on the respiratory and vasomotor centres; it has no direct action on the heart or peripheral vessels. Its dosage is much smaller than that of cardiazol (0·015 to 0·03 gramme), and it is effective when given by any parenteral route as well as intravenously.

EFFECTS OF INJECTION

For the induction of convulsions we have used a 5 per cent. solution. We have found that convulsions can be readily induced by quantities ranging from 0·7 to 2·5 c.cm. of this solution given intravenously. The majority of patients require between 1·2 and 1·8 c.cm. The type of convulsion produced is, with correct dosage, the full major epileptic fit. If too small a dose has been given, disturbances of consciousness ranging from slight clouding to complete inaccessibility may be produced, together with myoclonic twitchings of varying degrees of severity.

The excretion of triazol appears to be somewhat slower than that of cardiazol. Consequently the injection need not be given with any special rapidity, though the smallness of the dose makes it easy to do so. Should the amount given prove to be too small and fail to induce a fit, a supplementary dose of a third to half the original dose is sufficient to bring on the fit if given up to two minutes after the original injection, whereas with cardiazol it is necessary to give a second dose larger than that first used. Occasionally, if too great a supplementary dose has been given, a second fit may follow a few minutes after the first one.

Sclerosis of veins has not occurred in any of our cases, presumably because there is less chance than with cardiazol of lacerating the vein wall, while at the same time the solution is less irritating to the tissues.

When given intramuscularly, approximately twice the intravenous dose is required, though there are individual variations and it is best to begin with a somewhat smaller dose. The convulsion follows after a delay of 5–15 minutes. During this interval the patient may show no symptoms, or may have myoclonic twitchings of increasing severity leading up to the full major fit; or there may be an increasing degree of confusion, with or without myoclonic twitchings.

The pulse and blood pressure react in a similar way to that seen with cardiazol; the pulse-rate increases at the moment of the injection and remains at an average of 120–140, often for half an hour or more after the fit. The systolic pressure rises about 20 mm. for the same time; the diastolic pressure follows, but not to the same extent. In four cases, the blood-pressure readings showed a gradual rise of 20–30 mm. during the course of the treatment. Two cases behaved conversely in that the blood pressure became lower after the fit; they showed no continuous change.

Changes of mood during the induction stage vary in different subjects. Most patients remain placid and say they are "all right" until they lose consciousness. Quite often we have observed euphoria in the interval before the fit, even when, with intravenous administration, this has been of only a few seconds' duration. Occasionally there is agitation or impulsiveness.

After the fit, recovery is usually rapid, but there may be a short period of restlessness, as with cardiazol. Vomiting was a troublesome sequel in our early cases, but routine premedication with 1/100 grain of atropine, given one hour before the treatment, has completely abolished this.

Amnesia for the effect of the drug appears to be more complete than with cardiazol. Often the patients cannot recall having had any kind of treatment, or think that the atropine premedication was the actual treatment. Amnesia is seen just as often in cases where the fit has been delayed or has failed to occur at all. Apart from amnesia, the patient's recollection of his experiences rarely has the frightening quality seen with cardiazol. As previously stated, euphoria and even hilarity have been observed

* Working with the support of the Rockefeller Foundation.

[1] Behrens, B., Dinkler, G., and Woenckhaus, E., *Klin. Wschr.* 1937, **16**, 944.

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during the induction stage, and this may colour the patient's subsequent vague recollection of the events. The description given by most patients is that they have "felt giddy" or "felt they were going off," but this is regarded as quite bearable, and except for one or two agitated cases, all our patients have continued to come forward willingly for treatment.

BENEFIT OBTAINED

Thirty-three patients have been treated up to the present, the total number of convulsions induced being over 350. Of the 33 patients, 12 had previously begun treatment with cardiazol and their course was continued with triazol; 21 were treated with triazol from the start. Our material has been of a very varied kind; we have had few cases of recent onset available; and most of the cases have been of from eighteen months' to five years' standing. At this stage we do not feel justified in presenting results in statistical form. However, our impression is that the results to be expected are similar to those obtainable with cardiazol. Those patients who had begun treatment with cardiazol showed no change in their progress, if any, towards improvement, after the substitution of triazol. Of the 21 patients treated throughout with triazol, 6 have completed their course and of these 3 are now in convalescent wards with a prospect of discharge in the near future: 2 are much improved, but their immediate outlook is still uncertain; 1 is unimproved. Fifteen patients are still under treatment, of whom 7 have already shown some degree of improvement. Most of the effects described for cardiazol, such as phases of temporary lucidity and reactivations of the psychosis, have been seen in our series.

Apart from the therapeutic effects, it is clear that the possibility of producing, by intramuscular injection, a slow-motion picture of the onset of an epileptic attack affords opportunities not otherwise available of investigating epileptic phenomena. As stated above, a sub-convulsant dose gives rise to a confusional or twilight state of varying duration and appearance. By repeated injection of small doses, this twilight state can in some cases be prolonged for several hours. It is possible that the induction of such states may prove to have a therapeutic value, but we have not yet been able to satisfy ourselves on this point. Here again, however, an opportunity presents itself for further investigation into the metabolic changes accompanying twilight states. Accordingly we are now engaged, in collaboration with the staff of the Central Laboratory of the L.C.C. Mental Hospitals, in observations on blood changes in both the pre-convulsive and the twilight states, of which we hope to publish the results in a later communication.

SUMMARY

Cyclohexyl-ethyl-triazol appears to have several advantages over cardiazol in the convulsion treatment of schizophrenia; of these the chief are the lessened unpleasantness of the treatment to the patient; the smaller dosage and the ease with which failure to induce a fit can be rectified by a supplementary dose; the elimination of venous sclerosis; and the possibility of intramuscular use in cases where intravenous injections are impracticable. In our opinion, it should be given an extended trial.

Our thanks are due to Dr. G. A. Lilly, medical superintendent of Cane Hill Hospital, for permission to make use of the clinical material, and to the firm of C. H. Boehringer Sohn, Nieder-Ingelheim, for supplying us with liberal quantities of triazol for our experiments.

PRIMARY TUMOURS OF THE LACRIMAL SAC

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Primary tumours of the lacrimal sac are rare. Strada and Zavalia (1925) collected 26 cases and wrote an excellent article on the subject. Later, in 1935, Zavalia and Oliva brought the number up to 43. We have been able to collect details of 64 cases from various sources and shall give a full description of a case seen by one of us. In this series the most common neoplasms are carcinomata, papillomata, and sarcomata, but other types of growth have been encountered, The following Table shows the nature of the neoplasms.

Adenoma	1
Carcinoma	24
Endothelioma	4
Fibroma	2
Lymphoma	5
Papilloma	7
Plasmocytoma	1
Sarcoma (melanotic 2*)	20
	64

* It is difficult to see how these can actually have originated in cells in the sac; yet in both cases there seems to be no doubt that this was their real starting-point.

Four of the tumours were bilateral, 2 of these being lymphomata.

In almost every case there is a long history of epiphora, often over a period of years. This is usually treated as a dacryocystitis, but gradually a swelling begins to show in the region of the sac, which may or may not be painful. Even at this stage the sac is sometimes patent on syringing. The swelling may be solid but is sometimes fluctuant and may exactly resemble a large mucocele of the sac; it differs from a mucocele, however, in not emptying completely on pressure. The swelling gets larger and becomes adherent to the skin, and the pre-auricular submaxillary, and later cervical, glands become involved. Distant metastases also occur. Strada and Zavalia divide the history of these growths into three periods: "pre-tumoral" (dacryocystitis); tumour; extension. Some of them seem to behave very like similar neoplasms in the bladder, chronic infection being followed by a papilloma, which in turn becomes carcinomatous. Several of the series, including our case, are just on the borderline of malignancy, and are classed by some as carcinoma, and others as papilloma.

Treatment.—There seems to be general agreement that the sac and tumour should be excised as completely as possible, and if there is any sign of extension outside the sac, the cavity should be cauterised. After operation or in inoperable cases, X rays or radium are of great value.

Prognosis.—If there is no extension outside the sac, and the tumour is not very malignant, the prognosis would appear to be fairly good. Even when the growth has come through the sac wall, X rays or radium effect a cure in some cases.

AUTHOR'S CASE

The following is an account of the case seen by one of us (G. G. P.).

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TABLE SHOWING RECORDED CASES

—	Sex and age.	Duration.	Growth.	Treatment and remarks.
Bakker and Oudendaal.	F.	1 m.	Basal-cell carcinoma.	Operation. Radium. No recurrence after 18 months.
Bietti.	F., 31	—	Hæmangio-endothelioma.	Operation. No recurrence. (Patent lacrimal passage.)
Bistis.	M., 61	—	Carcinoma.	Operation. Recurrence.
Braunschweig.	—	—	Round-cell sarcoma.	Growth had broken through lamina papyracea. Radical operation. No recurrence.
Butler.	F., 17	—	Small round-cell sarcoma.	Extended in spite of several operations, though there were no distant metastases. Died in 10 months.
Cabannes.	—	—	Carcinoma. "Pavement-celled." Probably from walls of duct.	Extended into nasal fossæ.
Creutz.	—	—	Lymphoma.	—
Denti.	F., 50	—	Papilloma.	Mother said to have died from malignant tumour in same region.
de Vincentiis.	M.	—	Sarcoma.	Many months. Incised, later removed.
Dupuy-Dutemps.	F., 22	6 m.	Papilloma.	Tiny papillomata of conjunctiva also present. Sac growth removed. Cavity cauterised. 24 years later a "papillary epithelioma" was removed from nasal fossa on same side.
Eberle.	M.	Long time.	Hard papilloma.	Removal of sac and tumour.
„	M., 59	—	Plasmocytoma.	Removed. No recurrence after 4 months.
Halbertsma.	F., 68	1 m.	Carcinoma.	Removed. X rays. No recurrence after some weeks.
Herrmann.	F., 37	Some time.	Hard papilloma.	Growth removed with sac. No recurrence after 9 months.
Hilden.	M., 18	—	Malignant papilloma.	Removed. No recurrence after 1 month.
Hird.	F., 39	3 days.	Papilloma.	Papillomata of conjunctiva removed 26 years previously. Sac growth removed, gap cauterised. No recurrence.
Jones.	—	—	Carcinoma.	Removed.
Kalt.	M., 40	Many years.	Fibroma.	Sac removed with tumour. No recurrence.
Lafon.	M., 48	10 m.	Epithelioma.	Operation. No recurrence.
Landau.	M., 67	2 m.	Epithelioma.	Radical operation. No recurrence.
Maggi.	F., 56	—	Endothelioma.	Followed chronic dacryocystitis.
Margotta.	F., 47	2 yrs.	Melanotic sarcoma.	Bleeding from puncta and nose. Died in a year from metastases.
Matteson.	—	—	Sarcoma.	—
Meisner.	F., 60	6 m.	Sarcoma.	No recurrence after 3 years.
Moauro.	—	—	Angio-myxosarcoma.	Bilateral.
Muirhead.	M., 60	5 m.	Transitional-cell carcinoma.	Incised and scraped. X rays. No recurrence after 9 months.
Murawleschkin.	F., 38	1 m.	Melanotic sarcoma.	Removed. Rapid recurrence at site of operation and in glands.
Noble.	M., 58	10 yrs.	Carcinoma.	Excised by diathermy.
Pascheff.	M., 70	2 yrs.	Lymphoma.	Bilateral. Died of recurrence 1 year later.
„	M., 52	—	Adenoma.	Sac removed with tumour.
Pasetti.	M., 73	1 yr.	Epithelioma.	Removal of sac and growth. No recurrence after 1 year.
Penman.	M., 75	5 yrs. plus.	Proliferating papilloma.	Removal of sac and growth. No recurrence after 1 year.
Perrod.	—	—	Lymphangio-endothelioma.	—
Pfingst.	F., 11	6 m.	Spindle-cell sarcoma.	Had had previous operation. Section showed no positive evidence of malignancy. Radium applied to recurrence 2 years later; 3 years after this radium applied to a further recurrence showed spindle-cell sarcoma.
Piccoli.	F., 56	—	Carcinoma.	No antecedent epiphora. Refused operation. Died in a few months with extension into ethmoidal and sphenoidal sinuses.
Posey.	M., 74	—	Tubular epithelioma.	Sac removed (contained pus and polypoid material). Much thickening of walls.
Rollet.	M., 65	1 yr.	Atypical epithelioma.	Removed complete with sac. No recurrence.
„	F., 61	5 m.	Polypoid sarcoma.	
Scholtyssek.	F., 70	1 yr.	Lymphosarcoma.	—
Sédan.	F., 44	—	Lymphoblastoma.	Rapid recurrence after removal of sac and an intra-orbital extension. The local recurrence cleared rapidly with X rays, but the patient died with invasion of all lymphoid tissue.
Seggel.	M.	—	Papillary epithelioma.	—
Sena.	M., 37	—	Cylindroma.	Operation. (Had operation for "cancer" in Italy 5 years before.)
„	F., 47	—	Sarcoma.	—
„	M., 37	4 yrs.	Epithelioma.	Electrocoagulation of tumour. Radium. Eye lost, but no recurrence.
Sgrosso.	F., 25	—	Sarcoma composed of polymorphous cells.	Died.
„	—	—	Epithelioma.	—
„	M., 34	1 m.	Endothelioma.	Bilateral. Removed. No recurrence.
„	F., 18	1 yr.	Angiosarcoma.	Removal of sac and tumour.

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TABLE SHOWING RECORDED CASES—(*continued*)

—	Sex and age.	Duration.	Growth.	Treatment and remarks.
Silvestri.	M., 63	—	Sarcoma.	Many operations, with recurrence in submaxillary and parotid regions.
Singer.	—	—	Sarcoma.	—
Sneguireff.	F., 49	—	Round-cell sarcoma.	Removed. No recurrence after 8 months.
Spratt.	M., 78	2 m.	Carcinoma.	Removed. Recurrences in orbit and at angle of jaw. No further recurrences after three operations in 4 years.
Stallard.	F., over 60	—	Carcinoma.	—
Stastnik.	—	—	Carcinoma.	—
Strada and Zavalia.	F., 57	2 m.	Carcinoma.	Died in 10 months despite X ray therapy.
Strzeminski.	F., 38	Long time.	Cavernous fibroma.	Fistula and swelling of sac. Tumour removed and fistula closed. Cure obtained with patent sac.
Sulcer and Duclos.	F., 51	Short time.	Lymphoma.	Bilateral. Incision and cautery. Generalised involvement of lymphatic glands.
Tennent.	M., 43	6 m.	Carcinoma.	Died 6 months after operation. Bone involved.
Tessier.	M., 33	—	Sarcoma.	Total destruction of sac and surrounding tissues. Submaxillary glands enlarged. Patient died in 6 months.
von Grosz.	—	—	Sarcoma.	Exenteration of orbit. Patient died.
Weve.	F., 59	1 yr.	Lymphoma.	Excised. Recurrences on more than one occasion but these disappeared with X rays.
Zannoni.	F., 84	6 m.	Spindle-cell sarcoma.	Radical operation. Metastases in pre-auricular and submaxillary glands.
Zavalia and Oliva.	M., 36	1 yr.	Carcinoma.	Removal of tumour plus X rays and radium. Many recurrences.
"	M., 47	1 yr.	Carcinoma.	Removal of tumour plus radium. One small recurrence removed. Well after 4 months.

m. = months ; yrs. = years.

A man aged 75 was seen on Jan. 5th, 1932, with a small swelling of the lacrimal sac. On this occasion operation was not advised, as there was no regurgitation, and the little mucocele gave him no trouble. At the next visit, on Dec. 29th, 1936, the swelling had increased to the size of a small bantam's egg. It still felt fluctuant, and appeared to be due to an enormously distended lacrimal sac. An attempt was made to syringe through into the nose, but it was not successful.

The swelling was opened under local anæsthesia, and found to be full of soft polypoid material; the large cavity seemed to extend down towards the nose. It was thought that the trouble might have originated in the nose, and when the sac and contents were later excised under general anæsthesia, Mr. W. A. Mill was present and explored the nose and nasal sinuses on that side. The sac was found to have expanded the bone and bulged into the nose. The thin expanded inner wall of the lacrimal fossa was removed and the cavity drained into the nose. No growth could be seen outside the walls of the thickened sac, but microscopically it was found that the growth had actually eroded through into the nose. Apart from rather slow healing of the wound, recovery was uneventful, and the cosmetic result was excellent, the only deformity being a very slight ectropion of the lower lid. After consultation with the radiologists it was decided, in view of the probable non-malignancy of the growth, not to give any radium or X ray treatment, for it might possibly do more harm than good in this case, by stirring up any tumour cells left behind to activity. When the patient was seen a year later there was no sign of recurrence.

The growth was sectioned and was found to be essentially a papilloma (Fig. 1), each portion of the tumour having a central core of blood-vessels, surrounded by epithelium. This consisted in parts of columnar cells in two layers—as does the lining of the lacrimal sac—but in many places these had proliferated and become many-layered. Also the cells themselves had often ceased to be columnar and become polyhedral.

This essential structure of the tumour was not obvious in all sections. Indeed one had to search very diligently to find an area as in Fig. 1. For the most part the tumour appeared as in Fig. 2. Such an appearance was probably produced by a cross-section of numerous papillæ which had become fused together.

FIG. 1.—Section showing the essential papillary structure of the tumour. (× 190.)

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A similar picture is seen in the malignant papilloma of the limbus. Fig. 3 shows an enlarged view of two neighbouring papillæ. The cells immediately surrounding the central core of blood-vessels stained deeply while those further away represented the degenerated cells which would normally be cast off. In certain places these had broken down to form a cyst. No definite evidence of infiltration of the sub-epithelial tissues was found, but the tumour was obviously proliferating and was no doubt on the borderline of malignancy.

RECORDED CASES

The accompanying Table summarises the recorded cases.

The article by Guibert and Gueriteau (1905) on "epithelioma of the lacrimal sac" is usually quoted in lists of these cases. The condition appears however to have been an epithelioma of the skin which gradually ulcerated and involved the sac. Others often quoted seem to have been granulomatous polyps—e.g., Cardello (1936) three cases of plasma-celled tumours; Janin (1722) polyp; Neiss (1822) polyp; Piesbergen (1921) granulation tumour; Rizzo (1923) polyp; Tooke (1912) two polyps; and Wagenmann (1906) papilloma.

Henke and Lubarsch (1931) describe a group of pre-lacrimal tumours which are cystic swellings filled with glairy fluid, and lie next to, or in front of, the sac. They are not emptied on pressure and the lacrimal passages are patent. They have been variously regarded as (*a*) retention cysts of the glands of the sac wall, (*b*) diverticula of the sac in which communication with the lumen of the sac has become cut off, (*c*) misplaced islets of epithelium, (*d*) pre-lacrimal inflammation.

SUMMARY

1. The most common types of primary tumours of the lacrimal sac are the papilloma-carcinoma group, and the sarcomata.

2. The condition closely resembles a chronic dacryocystitis, and there is almost always antecedent epiphora.

3. Treatment consists of extirpation of the sac and growth, followed by application of X rays or radium in suitable cases.

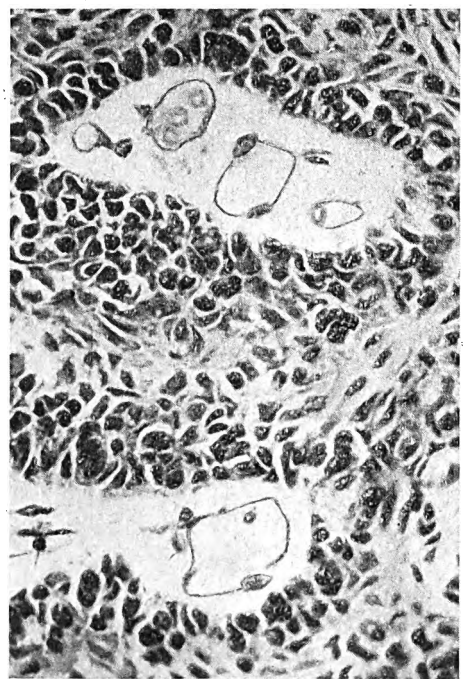

FIG. 3.—A portion of Fig. 2 under higher magnification. (× 370.)

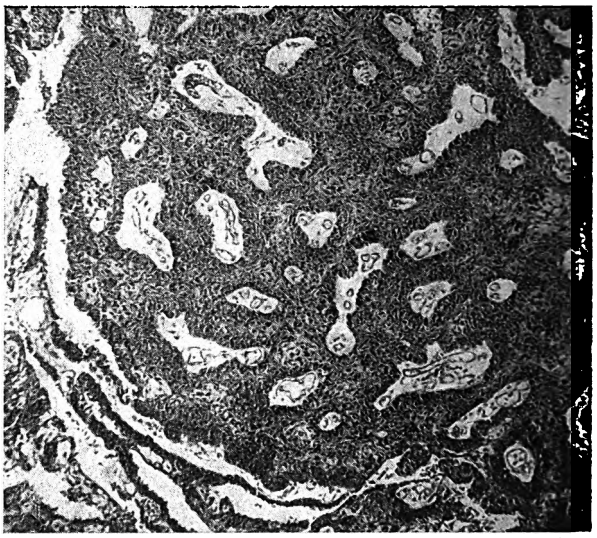

FIG. 2.—General low-power appearance of the tumour. (× 55.)

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PREGNANCY AND OLEOTHORAX

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THE effect of pregnancy and parturition on the evolution of pulmonary tuberculosis remains a subject of controversy, and the conclusions reached by different workers are remarkably discordant. There is good evidence, however, that the outlook for the pregnant tuberculous woman is greatly improved when medical and obstetrical care are coördinated. Reports, such as that of Jennings, Mariette, and Litzenberg (1932), from institutions where there is provision for delivery to be conducted actually in the sanatorium and for an adequate term of sanatorium treatment after delivery suggest that, in these ideal circumstances, there is little evidence that pregnancy has a deleterious effect.

Evidence of the effectiveness of various forms of collapse therapy during pregnancy is steadily accumulating. Rist and Jottras (1935) have reported 132 cases of artificial pneumothorax treatment in pregnant women with convincingly good results, though their experience has led them to the conclusion that pregnancy per se has a grave effect on the evolution of pulmonary tuberculosis. Peters and Davenport (1937) collected from the literature 17 cases of bilateral pneumothorax in pregnant women and added 1 further personal case; Blisnjanskaja and Lasarevitch (1936) described 7 personal cases of pregnancy in women who had undergone thoracoplasty for pulmonary tuberculosis and collected 12 similar cases from the literature, showing generally favourable results; and a case of pregnancy in a woman who had been treated by apicolysis and plombage has been reported by Pavlovsky (1937).

I can find no record of a case of pulmonary tuberculosis treated by oleothorax in which pregnancy has supervened. Such a case, in which the normal course of the pregnancy was entirely undisturbed, is here described.

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CASE REPORT

A housewife, aged 30, was admitted to the obstetrical department at Hammersmith Hospital on Sept. 24th, 1935, nearly at term, on account of a severe hæmoptysis on the previous day. She had had a cough almost from the beginning of her pregnancy; this had been accompanied by some sputum in the last three months, but she had noticed no deterioration of her general health. She had had no serious previous illnesses, and her family history contained nothing of note. On the day following admission she went into labour, and was delivered of a healthy child weighing 9¼ lb. The child was isolated from the mother, and, although it did well at first, died at the age of two months in another hospital of "gastro-enteritis."

I first saw her two weeks after delivery. She was a fairly well-nourished woman, weighing 113 lb. There was a well-marked diffuse thyroid enlargement without any signs of hyperthyroidism. The chest showed slightly impaired movement and percussion note at the left base, with numerous coarse râles up to the 6th rib posteriorly. Other systems showed no gross abnormality. The sputum averaged 30–60 c.cm. daily and contained tubercle bacilli in moderate numbers. A radiogram of the chest (Fig. 1) showed a large cavity in the middle zone of the left lung, with coarse mottling below it; in the lateral plane the cavity was seen to lie posteriorly, at the apex of the lower lobe. The temperature chart showed an evening rise to 99° F. once in every two to three days.

On Oct. 22nd, 1935, an artificial pneumothorax was induced on the left side. With the maximum collapse obtainable without mediastinal displacement, the cavity remained patent, obviously on account of adhesions (Fig. 2). The patient was very nervous of any further intervention, and it was therefore impossible to attempt thoracoscopy for division of these adhesions; moreover, she resolutely refused to go to a sanatorium. She was therefore discharged on Dec. 21st to attend as an out-patient for refills. She was much improved, having gained 4 lb. in weight and was now afebrile. Her sputum was reduced to about 5 c.cm. daily but still contained tubercle bacilli.

For the next few months she slowly lost weight, and had a constant slight cough with scanty bacilliferous sputum, but otherwise complained of no special symptoms. The cavity remained open. During July, 1936, the pleural pressures were rising more rapidly with smaller refills, and at the end of August she fairly rapidly developed an effusion half filling the pleura (Fig. 3). At the beginning of September she had a profuse eruption of erythema nodosum on the legs and forearms, and her weight had by then dropped to 100 lb. She refused admission to hospital. Her effusion was partially replaced by air on Oct. 20th; the fluid was slightly turbid, contained no tubercle bacilli, and was sterile on culture.

By January, 1937, it was clear that there was an obliterative pleurisy, the base of the lung creeping out gradually under the fluid; and careful screening in various postures showed that at length the cavity had closed. It was therefore decided to convert the hydropneumothorax into an oleothorax in order to combat the obliterative pleurisy, and with some difficulty the patient was persuaded to enter hospital for this purpose, on Feb. 1st.

At this time her weight was 105 lb., and she had a trace of sputum only, in which tubercle bacilli were not found. On Feb. 2nd 10 c.cm. of slightly turbid fluid was removed and 10 c.cm. of sterile olive oil introduced. There was no reaction to this, and on the 4th, with the patient in the upright posture, 760 c.cm. of fluid was aspirated through a needle in the lower axilla and replaced by 560 c.cm. of oil and 200 c.cm. of air. On the 8th, with the patient lying on the right side, 260 c.cm. of air was removed and replaced by an equal volume of oil. A radiogram after this showed some air still present at the apex

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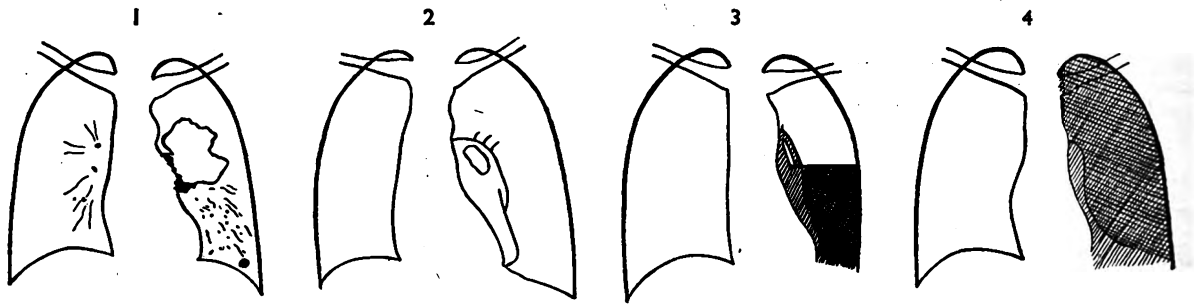

FIG. 1.—September, 1935. Large cavity at apex of left lower lobe, with infiltration in the rest of the lobe.

FIG. 2.—March, 1936. Artificial pneumothorax; cavity not collapsed.

FIG. 3.—August, 1936. Hydropneumothorax; cavity collapsing.

FIG. 4.—July, 1937. Oleothorax; cavity collapsed.

(The figures were prepared by photographic reduction from tracings of the original radiograms.)

of the pleura, and as it was desired to complete the filling of the oleothorax while the patient was still in hospital, this residual air-bubble was replaced by an equal volume (160 c.cm.) of oil. It was brought within reach of a needle in the lower axilla by placing the patient on her right side and raising the foot of the bed on blocks. The final pressure of the oil was 2–3 cm. of oil above the level of insertion of the needle, with the patient in this posture. A total of 1000 c.cm. of oil had been introduced. A radiogram then showed complete filling of the left pleura. There was no reaction and the patient was discharged on Feb. 20th.

Remarkable improvement followed. By June, 1937, her weight had increased to 128 lb. There was no sputum. The only untoward incident was the appearance of a subcutaneous cold abscess in the region of the angle of the left scapula. This was not related to any of the needle punctures, which had all been made in the axilla, and it did not communicate with the pleura. Aspiration of this abscess on June 14th produced 50 c.cm. of creamy pus, sterile on culture but yielding tubercle bacilli on guinea-pig inoculation. A needle inserted into the lower part of the pleura on the same day found thin turbid fluid, of which 150 c.cm. was aspirated and replaced by 120 c.cm. of sterile olive oil. A radiogram was taken with a penetrating ray but it failed to demonstrate any caries of ribs; it showed very well the complete closure of the old pulmonary cavity (Fig. 4). The subcutaneous abscess was aspirated on three further occasions and then did not again accumulate.

In July the patient was found to be about 2½ months pregnant. Discussion of the medical aspects of the advisability of termination of pregnancy was pointless on account of the patient's religious convictions. There were no untoward incidents during the pregnancy, the patient remaining entirely free from symptoms throughout, and there seemed to be no indication for adjustments in the oleothorax. On Feb. 13th, 1938, she was delivered of a healthy male child weighing 8 lb. 2 oz. The puerperium was normal and afebrile. On the 24th she was transferred to the medical wards. There were no symptoms, her weight was 134 lb., and a small amount of material expectorated with some difficulty contained no tubercle bacilli. On March 3rd, with the patient in the sitting posture, a needle inserted in the 5th space in mid-axilla found perfectly clear fluid, the pressure being 15 cm. of fluid above the level of insertion of the needle. Before oil started to flow 100 c.cm. of this fluid was aspirated and 90 c.cm. of sterile olive oil was introduced to replace the fluid withdrawn. The final pressure was about 10 cm. of oil. She was discharged from hospital on March 5th. Since then both she and her child have remained well, and when last seen on May 7th she was free from all symptoms.

COMMENT

Oleothorax was established in this case in order to combat an obliterative pleurisy. The pneumothorax had only just become effective in collapsing the cavity when this complication appeared, and it was clear that unless the obliteration could be checked the cavity was likely to reopen. The value of oleothorax in these circumstances—the "inhibition" oleothorax of American authors or the "oléothorax antisymphysaire" of the French—has been emphasised especially by Chandler (1937). As the latter points out, it is in cases in which an effective pneumothorax is the seat of an obliterative pleurisy that the conditions for safe induction of oleothorax are present—namely, a rigid mediastinum and a thick-walled pleural space of limited capacity. Unless air refills can produce a rapid rise of pressure to above atmospheric without either distress to the patient or mediastinal displacement, the conditions within the pleura are not suitable for oleothorax. The only alternative to oleothorax in a case of obliterative pleurisy occurring early in pneumothorax treatment for grossly cavitated pulmonary tuberculosis is thoracoplasty.

In following the course of the case through pregnancy there were certain misgivings about the possible effect of the rising diaphragm on the pressures within the oleothorax. Careful clinical and radiological studies showed no evidence of a rising intrapleural pressure, and it was thought that no adjustments were needed. The reading of the pressure after delivery and the very small oil replacement of fluid which then needed to be made showed that this view was correct. The rate of absorption of oil from therapeutic oleothorax appears to be very variable. Though olive oil is stated to be relatively rapidly absorbed it is clear that in this case absorption was so slow as to be almost negligible.

An incidental point of interest was the appearance of erythema nodosum soon after the onset of fluid in the pneumothorax. From the point of view of the current theory that erythema nodosum is usually a manifestation of allergy to the tubercle bacillus, the coincidence of its onset with that of fluid in a therapeutic pneumothorax is a combination of events that would be expected to be not infrequent. I have not seen this coincidence previously, nor does a rapid survey of the literature suggest that it has been observed with significant frequency, though erythema nodosum may appear in association with all stages of tuberculous infection.

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In conclusion, this case report adds oleothorax to the list of methods of therapeutic lung collapse which have proved effective in enabling patients suffering from pulmonary tuberculosis to pass through pregnancy and parturition without ill effect.

This report is published with the permission of the chief medical officer, L.C.C.

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CONGENITAL ISOLATED DEXTROCARDIA DEVELOPING AURICULAR FLUTTER

By Harold Davis, M.B. Camb., M.R.C.P. Lond.
MEDICAL REGISTRAR TO THE LONDON CHEST HOSPITAL

Congenital dextrocardia without transposition of the other viscera is much less common than complete situs inversus. It seemed therefore that the case here reported would be of interest as auricular flutter with congestive failure and terminal septicæmia were present.

CASE REPORT

A married woman, aged 41, was admitted to the London Chest Hospital on April 27th, 1936, complaining of dyspnœa on exertion and cough. Six years previously she was said to have had pneumonia on the right side. After the birth of her youngest child she had a severe attack of palpitations lasting several days, accompanied by cough, shortness of breath, and slight œdema of the ankles. There was no history of rheumatism or chorea in childhood. She had been married for 14 years and had two children; the younger was 6 years old. There was no known heart trouble in any of her near relations.

On examination she was obviously short of breath even at rest in bed; she was slightly cyanosed about the lips and ears, and her skin was moist, with a subicteric tinge. Physically she was a fairly well-developed woman of average height with no external abnormalities of the face, body, fingers, or toes. There was no excessive pulsation visible in the vessels of the neck. An impulse was visible to the right of the sternum and the apex-beat was localised in the fifth interspace 3½ in. to the right of the midline. The area of cardiac dullness was continuous below with the area of liver dullness. There were no thrills palpable over any part of the chest, the rhythm was regular, the rate 90 per minute; the cardiac sounds were louder than normally at all areas, there being but slight difference between the first and second sounds. No murmurs were audible. The blood pressure was 128/86 mm. Hg in the left arm. There were a few moist râles at the bases of both lungs. The lungs showed no evidence of organic disease. The liver was on the right side and was not palpable; she was resonant in the epigastrium over the usual position of the stomach. The spleen and kidneys were not palpably enlarged. There was a little free fluid in the abdomen.

Special examinations.—Fluoroscopy showed that the heart lay in the right side of the thorax, with the aortic knuckle to the left of the midline, and much less prominent than usual (Fig. 1). The heart was moderately enlarged, the right border being especially rounded and prominent. The hilar shadows were denser than normally, and of the type associated with pulmonary congestion. The right side of the diaphragm lay at a lower level than the left and both moved equally well. The normal position of the abdominal viscera was confirmed. An electrocardiogram showed that auricular flutter with 4:1 heart-block was present at the onset of the illness (Fig. 2A). Subsequent electrocardiograms taken during the course of her illness showed auricular flutter to be persistent. One of these records is shown (Fig. 2B). A catheter specimen of her urine contained a trace of albumin, a few pus cells, a few red cells, and one or two granular casts. Blood examination (April 28th): leucocytes 18,500 cells per c.mm., of which 81 per cent. were polymorphonuclears, 12 per cent. lymphocytes, and 6 per cent. mononuclears.

Progress.—A provisional diagnosis of congenital isolated dextrocardia with auricular flutter and congestive failure was made. The patient was given digitalis in an attempt to convert the auricular flutter to fibrillation. There was a brief temporary improvement in her condition, but the rhythm remained unchanged. On July 4th she began to run a daily fever of 100°–101° F., for which no cause was found. She became weaker, the congestion increased, and she died on August 23rd.

Necropsy report.—Considerable œdema of the legs and back was present. The skin had an icteroid tinge. There was no excess of fluid in the pleural cavities. The pericardium was seen lying to the right of the midline. A few soft adhesions were present between it and the mediastinal pleura. There was no excess of fluid in the pericardium. The heart was enlarged, the muscle fairly good. The apex was formed by the right ventricle, the wall of which was hypertrophied. The cavities of the ventricles were filled with blood clot. At the apex of the right ventricle was an antemortem clot about the size of a walnut which had broken down and formed an abscess cavity filled with thick reddish yellow pus. The abscess was adherent to the heart wall over the lower half of its circumference. There was a similar antemortem clot in the left auricle, but the breaking down process had not progressed so far. There were no valvular lesions; the foramen ovale was closed. The aorta and pulmonary arteries arose from their correct ventricles, but the pulmonary artery passed behind the aorta instead of in front of it (Fig. 3).

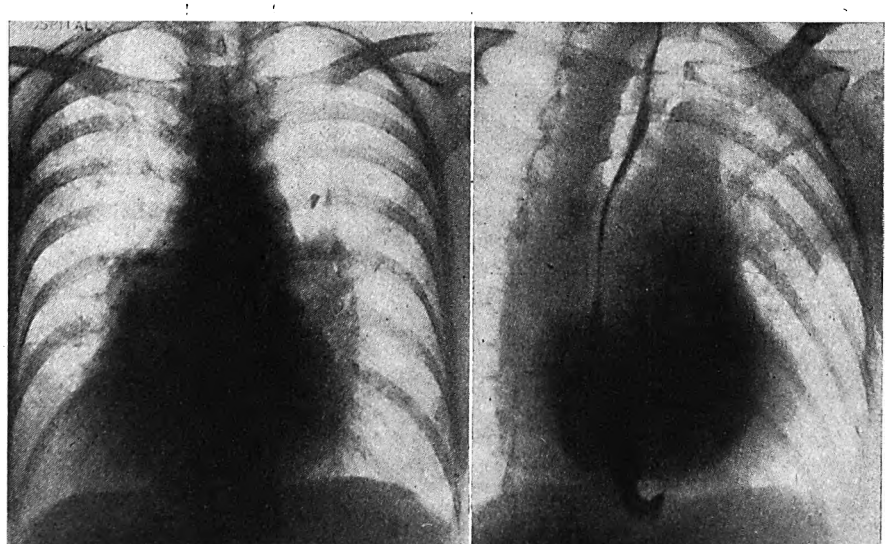

FIG. 1.—Radiograms showing dextrocardia and (in the oblique view) the outline of the abnormal pulmonary artery demonstrated by barium in the œsophagus.

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The aorta arose from the left ventricle in practically a straight line without the usual sweeping curve, the arch thus making an acute angle like a hairpin bend. It passed downwards across the left bronchus. The three main vessels arose from the aortic arch in their normal arrangement. The ductus arteriosus could not be found. The coronary arteries were normal. The thyroid gland was normal. Lungs: right, engorged, no infarcts; no fibrosis; the left showed a septic infarct in the lower lobe, breaking down into a cavity of about ¾ by ¾ in., the wall being formed by organising blood clot. The mediastinal glands were enlarged, soft, and acutely inflamed; no evidence of tuberculosis was found. In the abdomen, the stomach was on the left side; the small and large intestines were normal in appearance and position. The liver was normally placed, its cut surface showed the typical "nutmeg" appearance of chronic passive congestion. The spleen was enlarged and showed no visible infarcts. Both kidneys contained infarcts. The suprarenals were normal.

The post-mortem therefore showed congenital isolated dextrocardia with abnormal pulmonary artery, and an abscess cavity in the right ventricle.

COMMENTS

Dextrocardia has been recognised by clinicians and pathologists since the seventeenth century. But it was not until patients were investigated by means of X rays and the electrocardiogram that a critical study of the condition was possible during life, and an attempt made to classify the various types which have been observed.

Lichtman (1931), in his comprehensive study of the condition, defines dextrocardia as follows: "When the heart in its own development and independent of disease and anomaly in surrounding structures assumes a position in the right side of the thorax with the apex pointing to the right of the mid-line." Rösler (1930) uses the term dextrocardia to cover all cases in which the heart lies to the right of the midline. Mandelstam and Reinberg (1928) also apply the term to all cases in which the heart lies to the right of the midline; they suggest a classification which has the advantages of being simple

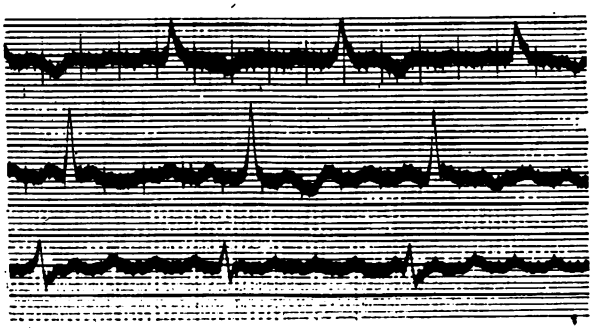

FIG. 2a.—Electrocardiogram of April 28th showing auricular flutter.

and of including most of the types of dextrocardia that have been observed.

These authors distinguish four types:—

Type I.—Dextrocardia in situs inversus totalis, characterised by a reversed X ray image and inversed electrocardiogram.

Type II.—Isolated congenital dextrocardia with inversion of the heart cavities, characterised by a reversed position of the heart and aorta and by an inversion of the electrocardiographic waves but a normal position of the abdominal viscera.

Type III.—Isolated congenital dextrocardia with normal interrelation of the cavities in which the heart is situated on the right, the aorta passes over the left bronchus, the abdominal viscera are normally placed, and the electrocardiogram is normal.

Type IV.—Acquired dextrocardia which is characterised by the same peculiarities as Type III with pathological changes in some of the adjoining organs.

By reason of the X ray and electrocardiographic evidence and the necropsy it will be seen that this case is of the variety described under Type III. It is complicated by the abnormal relationship between the pulmonary artery and the aorta. It is not uncommon, however, for anomalies of the great vessels to be present in this type. The necropsy suggests that the dextrocardia is due to a rotation of the long axis of the heart in a clockwise direction, so that the left ventricle lies anteriorly. The normal interrelationship of the respective ventricles to the aorta and pulmonary arteries is preserved. Nagel (1909) considers that this type of dextrocardia is due to the rotation of the long axis of the heart to the right instead of to the left as normally. He states that this abnormal rotation occurs probably not later than the sixth week during development.

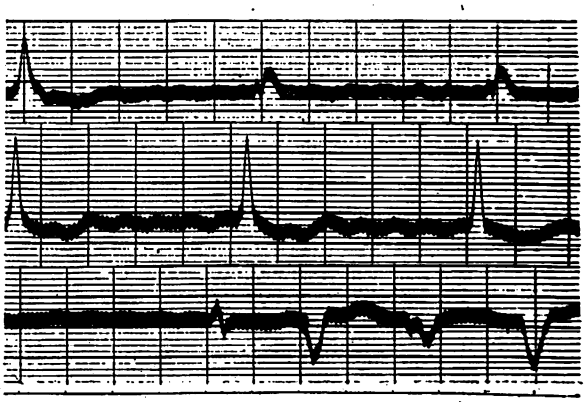

FIG. 2b.—Electrocardiogram of July 4th shows auricular flutter persistent despite digitalis therapy.

The combination of auricular flutter with dextrocardia must be an exceedingly rare event. Lichtman (1931) noted auricular fibrillation and complete heart-block and left bundle-branch block in his second case. His patient was engaged in active work at the time and did not appear to suffer any inconvenience from the arrhythmia. Potts and Ashman (1926) have reported a case of dextrocardia with retrograde conduction of ectopic beats to the auricle. Krestin (1927) has also reported a case of dextrocardia in which auricular fibrillation and possibly mitral stenosis was present. In Moffett and Neuhof's (1915) patient short paroxysms of auricular tachycardia are said to have occurred.

A search of the literature suggests that auricular flutter in a patient with dextrocardia has not yet been recorded. It is difficult to account for auricular flutter in a heart which, although abnormally placed, had apparently functioned normally for many years. In the present state of our knowledge, to conclude that the dextrocardia was in itself the cause of the arrhythmia seems to be unjustified.

The diagnosis of dextrocardia can usually be made at the clinical examination. Before it is assumed to be congenital, however, it is necessary to exclude the various causes of acquired dextrocardia. There are, of course, several well-recognised conditions in the thorax which may lead to displacement of the heart

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to the right side of the midline. It is less generally realised that acquired dextrocardia may be the result of enormous dilatation of the pelvic colon, as in a case reported by Hurst (1921). Blackford (1932) has pointed out that dextrocardia may be secondary to congenital eventration of the left dome of the diaphragm.

X ray examination of the thoracic and abdominal viscera, and the taking of electrocardiograms, are essential in order to determine which type of congenital dextrocardia is present. The prognosis in situs inversus totalis is good. In isolated dextrocardia the outlook depends on the presence or otherwise of associated congenital abnormalities rather than on the dextrocardia itself.

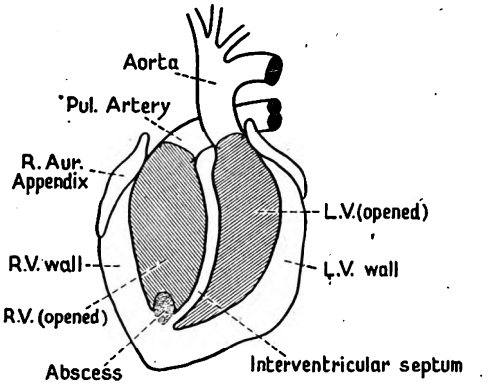

FIG. 3.—Diagram showing the condition found at autopsy.

I am indebted to Dr. E. H. Colbeck for permission to publish the case report, and to Dr. Roodhouse Gloyne for the report of the post-mortem.

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A GLOBULIN TEST FOR CEREBRO-SPINAL FLUID

BY K. O. NEWMAN, M.D. Vienna

PATHOLOGIST TO THE OXFORD COUNTY AND CITY MENTAL HOSPITAL

THE importance of estimating the globulin content of cerebro-spinal fluid in neurosyphilis and in a number of other pathological conditions needs no emphasis. Among numerous tests, such as those of Nonne-Apelt, Ross-Jones, and Noguchi, the one described by Pandy [1] in 1910 is probably the most popular because of its simplicity and sensitivity. But the preparation of the necessary reagent, concentrated carbolic acid, is not very convenient.

A solution of 1 part of phenol crystals in 15 parts of distilled water has to be left in an incubator for a period of between 12 and 48 hours and subsequently filtered. Alternatively, some recommend shaking up an excess of phenol crystals with distilled water in a large flask; this solution is then incubated, and immediately before it is used, the supernatant clear fluid is pipetted off from the brown oily residue. The fluid used for the test must be clear.

[1] Pandy, K., *Neurol. Zbl.* 1910, 29.

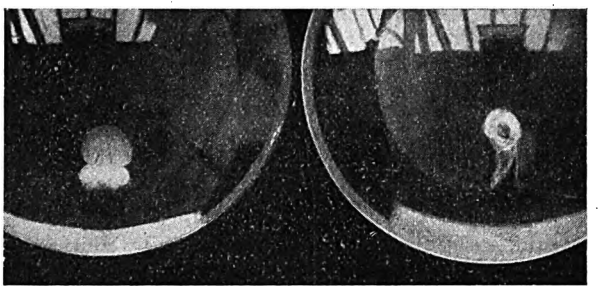

FIG. 1.—*Left:* effect of adding cerebro-spinal fluid (from a case of progressive paralysis) to a 5 per cent. solution of tannic acid. *Right:* effect of adding same fluid to phenol solution (Pandy's reaction). Both photographs taken one minute after addition of C.S.F.

The method now suggested consists in using a 5 per cent. solution of pure tannic acid in distilled water as a reagent, instead of phenol. The solution is rapidly made and keeps well. It is innocuous and can be prepared without laboratory equipment. The sensitivity of the test is very slightly greater than Pandy's, and the result of it can still be seen and estimated after a considerable period, whereas the result of Pandy's test vanishes after a few minutes. Figs. 1 and 2 demonstrate this fact.

The test is best carried out by putting approximately 1 c.cm. of 5 per cent. tannic acid into a watch-glass. One drop of cerebro-spinal fluid is allowed to run into the solution and the reaction reaches its maximum within a minute, after which it remains stationary. A positive reaction is graded in the usual way as + or ++ or +++.

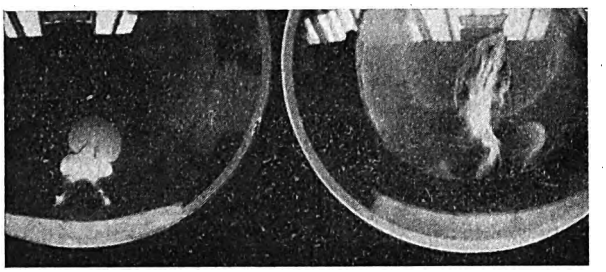

FIG. 2.—The same specimens as in Fig. 1, five minutes later.

It is hoped that this simple procedure will prove acceptable to the practitioner.

I wish to express my best thanks to Dr. R. W. Armstrong, medical superintendent of the Oxford County and City Mental Hospital, for facilities granted.

FOUNDERS DAY AT THE TRELOAR HOSPITAL.—On May 29th Sir Harry Twyford, Lord Mayor of London, inspected the completed hospital at Alton inaugurated nearly 50 years ago by his predecessor, Sir William Treloar. The building of night nurses' quarters had finished the work of reconstruction, and the chairman, Colonel Frederick Lawson, remarked that the next task was to rebuild the cripples' college where there were at present only 50 beds against 360 beds in the hospital itself. It was just as important, he said, that those who had been cured should be taught a trade. The Lord Mayor, in reply, said it was obvious to the least observant that the crippled children in London streets to-day were few as compared with a generation ago.

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MEDICAL SOCIETIES

SOCIETY OF MEDICAL OFFICERS OF HEALTH

AT a meeting of the fever hospital medical service group of this society, held in London on May 27th, a discussion on the

Modern Treatment of Cerebro-spinal Fever

was opened by Dr. C. G. K. THOMPSON (L.C.C.) Speaking of the treatment of meningitis by continuous spinal drainage as described in THE LANCET of Nov. 27th, 1937, he said that the results had been encouraging in spite of the fact that the death-rate had worked out at 36 per cent. Large doses of serum (160 c.cm.) were given intravenously on three successive days to combat the toxæmia and sterilise the cerebro-spinal fluid (C.S.F.). Experiments performed in conjunction with Dr. V. D. Allison showed that the serum thus given appears in the C.S.F. within two hours and that artificial agglutinins also pass the blood-brain barrier within two hours. This important finding lent weight to the principle of continuous spinal drainage. In all, 28 cases had so far been treated by the method, 19 of which were in the "severe" category and accounted for all the 10 deaths. Pulmonary complications were the cause of 6 of these deaths and they might possibly have been avoided; the actual death-rate from meningitis alone was only 14 per cent. Drainage was continued for an average of 150 hours (7 days); the greatest amount drained was 4185 c.cm., and the average amount was 2 litres.

The treatment in Dr. Thompson's opinion presented considerable advantages over the routine diurnal lumbar puncture, three of these advantages being the very rapid relief of the acute symptoms and restoration of comparative comfort, the prevention of blocking of the ependymal foramina of the fourth ventricle, and the prevention of loculation of the inflammatory debris in the subarachnoid spaces of the cord (particularly the perineural diverticula of the cord) which gave rise to the distressing spinal rigidity. It was rational to relieve the raised intracranial tension which was probably due in the main to the outpouring of inflammatory exudate and to the general increase in volume of the craniospinal contents, and to keep the pressure normal so that increase of congestion might hasten the process of repair. Any treatment that did not provide an adequate escape for this large amount of exudate entailed a very real risk of sequelæ in the form of nerve-root pressure from adhesions left by the loculated exudate.

Dr. H. STANLEY BANKS (L.C.C.) said that everyone would be impressed by the ingenuity of the continuous-drainage technique, but his own experience had led him to an entirely opposite conclusion as to the treatment of acute cases—namely, that drainage was unnecessary provided the C.S.F. could be rapidly freed from organisms. This could usually be achieved either by the intensive use of meningococcus antitoxin or with sulphanilamide. In the last 4½ years he had treated 107 acute cases. Of these, 38 had had serum alone, intravenously and spinally (fatality-rate 16 per cent.), and 58 serum intravenously with sulphanilamide in high dosage by mouth (fatality-rate 12 per cent.). The remaining 11 were selected cases treated with sulphanilamide alone (1 death). This comprised the whole of the material received during the period, except for certain groups of cases that were excluded as not being amenable to specific treatment. In the group receiving combined therapy there were 10 infants under one year, of whom 1 died. An investigation carried out at the Southern Group Laboratory had shown that serum given intravenously in this disease rapidly appeared in fractional amount in the C.S.F. and was maintained therein for several days. Sulphanilamide given by mouth appeared in the C.S.F. in about the same proportion as in the blood stream; it should be maintained at a level of about 5 mg. per 100 c.cm. for at least three days. The dosage required to secure this was high, averaging 1 gramme daily per stone of body-weight, and in infants two or three times this amount. The dose was reduced after three days and terminated in about nine days. Early cyanosis was not in itself an indication for reducing dosage. It was not due to sulph- or meth-hæmoglobin. The drug, even in the acute stage of this disease, could be administered by mouth. He considered that sulphanilamide therapy was a most important advance, but that in moderate and severe cases serum should be given in addition in a large dose, not intrathecally but intravenously, or in infants intraperitoneally.

Dr. SAGE SUTHERLAND (Manchester) said that during the five years 1933–37 201 cases of cerebro-spinal fever had been treated in hospital at Manchester. The annual fatality-rate varied from 28 per cent. to 47 per cent. During the last twelve months antibacterial and antitoxic serum had been administered intramuscularly, intravenously, and intrathecally, the average dosage being about 100 c.cm. and the fatality-rate (excluding deaths within forty-eight hours) was 37 per cent. In a survey of 201 cases treated during the last five years the lowest fatality-rate was 14 per cent. in the 5–10 age-group, and the highest 67 per cent. in the under 1 year group.

Dr. J. V. ARMSTRONG (L.C.C.) said he had watched Dr. Thompson evolve his method of treatment at the Brook Hospital and admired the ingenuity he had shown in overcoming the many difficulties that arose. He felt that the principle of continuous drainage—namely that free drainage should be given to a purulent exudate that was under pressure—was physiologically sound. The method had eliminated basal block, but unfortunately was inapplicable to infants, among whom basal block and hydrocephalus were common complications. He thought the fact that an infant discharged apparently cured might later develop hydrocephalus should always be taken into account in assessing any form of treatment. All discharged patients should be followed up. Dr. Banks's results with serum and sulphanilamide were most impressive. He was anxious to know how long the C.S.F. remained purulent under treatment and whether Dr. Banks had noticed any toxic effects of sulphanilamide besides cyanosis. He thought a soluble form of the drug would be of great advantage for administration by injection in the early unconscious stage of the disease. He finally mentioned the use of continuous drainage and sulphanilamide as being valuable in the treatment of streptococcal meningitis and said he knew of 4 cases which had recovered after such treatment.

Dr. R. A. O'BRIEN (Wellcome Physiological Research Lab.) suggested that the favourable results in Dr. Banks's series were due to the action of sulphanilamide not only on the meningococci, but also on the streptococci which might cause fatal broncho-

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pneumonia: antibacterial serum properly made would protect mice against lethal doses/of culture. Miss Branham had recently favoured the use of sulphanilamide as well as serum proved by mouse experiment to contain protective antibody.

Dr. J. E. McCARTNEY (L.C.C.) said that the most significant point about Dr. Banks's work was the swift disappearance of organisms and rapid reduction in the number of cells in the C.S.F. The cells indicated the degree of inflammatory reaction and their diminution showed the control of the infection. In the absence of infection therefore there were no inflammatory products to remove and repeated puncture and continuous drainage were unnecessary. There should be no aftermath of infection due to chronic fibrosis, and hydrocephalus should not supervene. By continuous drainage the products of inflammatory reaction were removed, but the infection itself was not touched and in consequence chronic inflammation with hydrocephalus was more likely to follow.

Dr. ERIC JEWESBURY (St. Bartholomew's Hospital) said there must be general agreement that Dr. Banks's results were very impressive. He spoke of 6 cases at St. Bartholomew's in which sulphanilamide, combined with specific therapy and regular lumbar drainage, had been employed.[1] Lack of experience had led to the sulphanilamide being given by various routes and the dosage had been smaller than Dr. Banks advocated. The response had therefore been slower. All the cases, however, had been severe ones and all had made good recoveries. Dr. Jewesbury mentioned a case in which the concentration of sulphanilamide in the C.S.F. fell after the dose by mouth had been doubled. The concentration and the effectiveness of sulphanilamide in the C.S.F. seemed to be variable and unrelated to one another; Crawford and Fleming,[2] for instance, found that in one case a concentration of 1·39 mg. per 100 c.cm. in the C.S.F. sterilised it, whereas in another similar case a concentration of 17·8 mg. per 100 c.cm. failed to do so. A constant dose by mouth often led to very variable concentrations in the C.S.F.

ROYAL ACADEMY OF MEDICINE IN IRELAND

AT the meeting of the surgical section held on March 11th, a paper on

Fractures of the Femoral Neck

was read by Mr. ARTHUR CHANCE. It described 48 cases treated by the Sven Johansson method, the advantages of which in Mr. Chance's opinion are (1) that it is safe, even for old people, (2) that it is followed by an easy convalescence, (3) that firm bony union is the rule, and (4) that excellent functional results are obtained. Of the 48 patients operated on, 7 died; 5 of these deaths were attributable to the operation—a mortality of 10·5 per cent., as compared with a mortality by conservative methods estimated at 20–25 per cent. Given good apposition of the fragments at reduction, and continued immobilisation by central positioning of the pin, bony union resulted in 86–90 per cent. of cases. Of 28 patients radiographed three months to a year after the operation, 22 showed firm bony union and in only 2 was there a definite non-union. A review of functional results in 30 cases operated on over six months showed 19 fit to return to their former occupations, 8 who had to use a stick or were unable to lead their similar pre-accident life, and 3 with poor functional result. Alteration in the position of the pin occurred in 14 cases, but in all but 1 of these there was already firm bony union. It was concluded therefore that a properly aligned pin never comes out in the early stages; when this occurred, with telescoping of the neck, it was due to too early weight-bearing. X ray examination at three-monthly intervals after operation was advisable to detect any movement of the pin. Arthritis was not the inevitable end-result of this method of treatment as was held by its critics. It was singularly absent in this series of cases.

Mr. J. L. KEEGAN said that when one considered what happened to these cases in former days, one could not fail to be greatly impressed by the improvement achieved by the procedure described.

Dr. R. W. SHAW said that in only 3 of the cases had it been necessary to give nitrous oxide as an adjuvant to the spinal anæsthetic. The great majority of patients had had no objection to spinal anæsthesia, but 3 patients had received Avertin and nitrous oxide alone.

Mr. DENIS KENNEDY mentioned the case of the old patient whose femur gave way without any violence whatever. He felt that no series of pins or operations would bring the neck of such a femur into satisfactory condition.

Mr. HENRY STOKES said that until the procedure described by Mr. Chance was introduced he had never seen what he would call a really good result in a case of fracture of the neck of the femur.

Mr. S. T. IRWIN'S own experience of this method had been gained in treating 33 cases during the last three years; he had also operated on 12 other patients by various other methods. One case had been treated by pinning fourteen months after the fracture, and firm bony union had been obtained, so that the patient could now get about well. At first he had allowed his patients up the day after the operation, to sit on a chair; but now he was sure this was bad, for although the pin would keep the head of the shaft together, it would not allow the patient to move much for the first three days. He now kept patients in the ward for eight weeks, and then allowed them up only if there was obvious evidence of new bony development at the seat of the fracture. He believed that this was a life-saving method. Mr. Chance and he had discovered a good many technical points in common. The guide-wire should never be extracted until the pin had got a good grasp of the head, and then the pin could be drawn out. The method he used was that of Hey Groves. There was only 1 case out of his 33 in which the apparatus had been at fault. It was essential to make certain that the inner pin was put down on the inner head of the femur and not on the line of fracture. This method of treatment was really very simple provided one had a good radiologist to help one at the operation, and also an assistant. It was necessary to have a really good team working together.

[1] Jewesbury, E., *Lancet*, June 4th, 1938, p. 1262.
[2] Crawford, T., and Fleming, G. B., *Ibid*, April 30th, 1938, p. 987.

MEMORIAL TO A COUNTRY DOCTOR.—A stained-glass window has been placed in the Ceiriog Memorial Institute at Glynceiriog, Denbighshire, as a tribute to John Matthews Jones of Coed-y-Glyn who for thirty years practised in this valley. The window, which was designed by Mr. J. A. Crombie, A.R.C., has three lights and depicts the doctor paying a visit to a farmstead in the valley. Dr. Jones died in 1923.

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REVIEWS AND NOTICES OF BOOKS

Clinical Roentgen Therapy

Edited by ERNST A. POHLE, M.D., Ph.D., F.A.C.R., Professor of Radiology; Chairman of the Department of Radiology and Physical Therapy in the University of Wisconsin. London: Henry Kimpton. 1938. Pp. 819. 45*s*.

A COMPREHENSIVE text-book of X ray therapy in the English language is needed. This one is the joint production of seventeen contributors who write from experience gained in the United States, Canada, France, and Germany, and is designed to be read in conjunction with the recently published work on theoretical principles underlying this treatment under the same editorial control. The first chapter on diseases of the blood and blood-forming organs, by O. O. Meyer (Wisconsin), includes discussion of the treatment of Hodgkin's disease, lymphosarcoma, and other diseases of lymph nodes. The dosage suggested for Hodgkin's disease is detailed, but since the author can give no general rule as to how often it should be repeated, he withdraws guidance just where it is needed.

The second chapter on diseases of the circulatory system by Ross Golden and Orville L. Henderson, both of New York, covers new ground without offering much hope of success by this form of treatment. G. E. Richards (Toronto), writing on the respiratory system and the breast, attributes so much importance to the dosage-rate that he alters his focal skin distance and milliamperage to obtain an average rate of 5 r per minute. It is difficult to see what advantage is gained by the method he describes, because judging from the illustrations, the same skin portal is used, at least partly, whatever the actual direction of the beam. He defines his skin erythema dose as 300 to 400 r measured in air, and gives a surface dose of 4000 to 6000 r per field at the rate of 200/250 r daily, without mentioning whether these quantities are measured in air or with backscatter. The illustrations of the method used for breast cancer are helpful. The technique suggested is an intensive fractional method, giving one-sixth of the total dose at each of six treatments, and thus delivering an erythema dose of 600 r plus 20 per cent. allowed for time. A second cycle is given two months after the first one, and a third three months after the completion of the second. H. Holfelder (Frankfurt-on-Main) contributes interesting notes on cases of malignant disease of the gastro-intestinal tract treated by radiation, and Charles A. Waters (Baltimore) writes on the urinary tract and male genital organs. Charles L. Martin (Dallas, Texas) is responsible for the important chapter on the female genital organs, which provides a sane and critical review of the various methods in use. He defines his dose of X rays carefully, the erythema dose being 600 r measured in air, with an increase of 33 per cent. if measured with backscatter. His radium doses are reckoned in milligramme hours. The chapters on the nervous system by A. Zimmern and J. A. Chavany (Paris), on the eye and ear by A. U. Desjardins (Rochester, Minn.), and on the glands of internal secretion by H. Langer (Pittsburgh) include many hints on the treatment of non-malignant conditions. O. Jüngling (Flensburg, Germany), writing on diseases of muscle, tendons, bones, and joints, recommends X ray therapy for a surprising number of infective diseases of bone. The book is completed by a chapter on cancer of the skin by J. J. Eller and on X ray reactions and injuries by G. A. MacKee, both from New York, with an appendix by M. J. Hubeny (Chicago) on the medico-legal aspect of these injuries. This deserves careful study. In the United States radiologists seem to be much harassed and sometimes hampered in their work by litigation about reactions to treatment. Even at the risk of causing unnecessary alarm it may become desirable to explain to patients or their friends in advance that some unpleasant reactions are to be expected.

This important work will be welcomed by radiologists. It is perhaps inevitable that any attempt to cover the whole field of therapeutic radiation should have become more like a text-book on medicine with special emphasis on radiation treatment than a practical guide. We commend its use for reference when required and not as a stimulus to the indiscriminate trial of radiotherapy either in conditions amenable to simpler remedies or in those unlikely, on the evidence available, to respond to any known method of treatment. The printing and illustrations are excellent, and a good bibliography is appended to each subsection.

Practical Talks on Kidney Disease

By EDWARD WEISS, M.D., Professor of Clinical Medicine, Temple University School of Medicine, Philadelphia. London: Baillière, Tindall and Cox. 1937. Pp. 176. 9*s*.

THIS book is an endeavour to summarise, in easily readable space, our present knowledge of nephritis. It does not attempt to compete with the large volumes which most authors seem to find necessary when they attempt an exposition of this complex subject. The author's plea to be excused errors of omission that can be easily corrected by reference to other works is disarming, but it must not prevent us from noting that his survey is somewhat marred by an outlook which ignores almost completely the work of the school of Widal, and must diminish the usefulness of any survey of kidney disease. It is only fair to add that the student who reads this little summary will be led in the right direction to pursue his studies.

Mothercraft: Antenatal and Postnatal

Second edition. By REGINALD C. JEWESBURY, D.M. Oxon., F.R.C.P. Lond., Physician in Charge of the Children's Department, St. Thomas's Hospital; Hon. Medical Director to the Mothercraft Training Society; Physician to the Victoria Hospital for Children. London: J. and A. Churchill. 1937. Pp. 188. 10*s*. 6*d*.

WHILST this book embodies the methods instituted by Sir Truby King, it also presents the fruits of Dr. Jewesbury's personal experience of their application over the past twenty years. As would be expected of the director of the Mothercraft Training Society, the author lays primary emphasis on the importance and management of breast feeding, which his teaching has done much to encourage. Study of the sections of the book devoted to artificial feeding suggests indeed that mothers who cannot afford a resident fully trained Truby King nurse might pardonably be tempted to prolong breast-feeding from sheer terror of the elaborate régime necessitated by weaning. Evidence that babies can be satisfactorily reared on the complicated formulas here recommended is not wanting; but since it is common knowledge that both normal and marasmic babies can also thrive on much simpler schemes of diet it seems a pity that

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Dr. Jewesbury has not been at more pains to justify a system that many regard as unnecessarily tedious and doubtfully scientific. In its second edition the book has, however, come more into line with the general trend of modern teaching, in that the introduction of whole milk and solids at an earlier age is now recommended. Apart from this, the changes are few but useful. The nutritional requirements set out by the special committee of the League of Nations are now supplied. The excellent sections on the relation of mothercraft to other aspects of maternity work and on the physiology of lactation, contributed respectively by Dr. J. S. Fairbairn and Prof. John Mellanby, F.R.S., have been brought up to date, though the hormonal control of lactation might with advantage have been discussed rather more fully.

Textbook of Hæmatology

By WILLIAM MAGNER, M.D., D.P.H., Pathologist, Saint Michael's Hospital, Toronto. London: J. and A. Churchill. 1938. Pp. 395. 18*s*.

THIS new text-book contains in addition to a description of the recognised blood diseases chapters on the normal physiology of the blood and on laboratory methods. It is illustrated with charts, three-coloured plates, and a large number of photomicrographs. Unfortunately the text is disappointing. For example there is only scant reference to the importance of sternal marrow puncture as a diagnostic aid and no account of the recent work on those problems of iron metabolism on which a proper understanding of the hypochromic anæmias depends. The book contains many irritating inaccuracies and contradictions; for instance on page 1 the average diameter of the red cells is said to be about 7·0 microns and on page 43 about 7·6 microns. We are unable to recommend this book without reserve either to students, physicians, or hæmatologists.

An Introduction to Dermatology

Third edition. By R. L. SUTTON, M.D., Sc.D., F.R.S. Edin., Professor of Dermatology in the University of Kansas; and R. L. SUTTON, Jnr., M.D., Instructor in Dermatology in the University. London: Henry Kimpton. 1937. Pp. 666. 21*s*.

THIS text-book for students was intended originally as a foundation upon which dermatological knowledge could be built. It is a pity that this plan has been to some extent abandoned. In this edition descriptions of over thirty diseases have been added, many of them extremely rare and of small import to the beginner. As a result the volume is larger by over a hundred pages. Some space could have been saved by leaving out the names of authorities, with which nearly every page is generously peppered. The inclusion of names without full references serves no useful purpose and has an irritating effect upon the reader. An addition which all will welcome is that of forty-five new illustrations all, like the original ones, of high quality.

Apes, Men and Morons

By EARNEST ALBERT HOOTON, Professor of Anthropology, Harvard University. London: George Allen and Unwin. 1938. Pp. 307. 10*s*. 6*d*.

To those who admired Hooton's patient scientific investigation of the ancient inhabitants of the Canary Islands, published 14 years ago, his new book must come as something of an anticlimax. In the writing of "Apes, Men and Morons," it is difficult to detect the hand of the painstaking physical anthropologist who compiled the monograph on the Guanches. The book consists of a series of loosely strung addresses, articles published in magazines, and chapters contributed to books. Since Prof. Hooton thinks that on the whole the dissemination of evolutionary teaching to the public at large may be inexpedient (p. 7) it is doubtful for whom this book is intended. It can hardly be that the author had in mind his fellow-workers. Not that there is a lack of good sound sense in the views advocated, or that the opinions expressed are devoid of real scientific support; but the soundness of the teaching is lost in a mass of waggish dicta, framed in a language ill-adapted to an account of serious work. It is as a manifestation of a modern trend, rather than as a mere isolated entity, that we deprecate this book. In 1897 Dorsey wrote his monograph on the cranial characters of Papuans, and thereby established his reputation, among serious workers, as a physical anthropologist. Many years later he took the easier path in writing: "Why we behave like human beings"; a very clever book, in its way, and one that had a certain vogue. It would be a disaster for the science of physical anthropology in America if the easier path were to become habitual.

A Short Textbook of Midwifery

By G. F. GIBBERD, M.B., M.S. Lond., F.R.C.S. Eng., M.C.O.G., Assistant Obstetric Surgeon, Guy's Hospital; Obstetric Surgeon to In-patients, Queen Charlotte's Maternity Hospital; Surgeon to Out-patients, Samaritan Hospital for Women. London: J. and A. Churchill. 1938. Pp. 529. 15*s*.

THIS text-book, which is not so very short, contains all the essentials of obstetrics. On the theoretical side there is not indeed much on this subject that the medical student has to learn. More perhaps than in any other branch of medicine, it is a wide clinical experience that is essential to efficient practice. When setting out to gain this experience, the novice must have by him a reliable guide to remind him of basic principles and Mr. Gibberd's book fills this need. It is definitely conservative in tone and this is as it should be for inexperienced readers; even the sulphanilamide group of drugs receives only guarded recommendation. Toxæmias of pregnancy, about which so little is known and so much has been written, are well discussed, and the treatment suggested is on sound lines. The chapter on puerperal pyrexia is up to date and comprehensive. We have noticed no omissions of any moment. The illustrations are well chosen and do not encroach unduly on the text. Minor good points about this book, which add considerably to the reader's comfort, are its convenient size, good paper, and clear printing.

Artificial Fever

By CLARENCE A. NEYMANN, A.B., M.D., F.R.S.M., Associate Professor of Psychiatry, Northwestern University Medical School, Chicago. London: Baillière, Tindall and Cox. 1938. Pp. 294. 27*s*.

A TEXT-BOOK epitomising the facts known about fever induced by physical means is timely, though this volume, written by one of the pioneers of this form of treatment, hardly does full justice to its subject. Dr. Neymann certainly has the grasp of essential facts which would be expected from one who has helped to guide "electro-pyrexia"—as he calls it—through the difficult phases of immaturity. He

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discusses the history and rationale of machine-produced fever and the effects of this treatment on physiological processes. The different techniques of induction and maintenance are described with full reference to much of the important experimental work. Dr. Neymann is a firm advocate of the method of producing fever based on the principle of electro-magnetic induction and believes that by this means actual heating of deep tissues is secured. He seems to be unduly critical of other methods which involve external heating and therefore transference of heat to the tissues through the medium of the skin—methods which have proved safe and effective in expert hands. The omission of details of the nursing technique in electro-pyrexial treatment is unfortunate in view of its vital importance. The later chapters deal with individual diseases, for the treatment of which electro-pyrexia is, or has been, used, and here much space is devoted to the history and clinical features of each individual disease in the form of sketchy summaries which are irrelevant to the main argument. The effects of artificial fever as far as they are known at present are carefully and fully described in the light of personal experience and recorded results. Some of the conclusions drawn—as, for instance, in the chapter on multiple sclerosis—seem to be based on hope and enthusiasm rather than on the material facts. Dr. Neymann's style is, for the most part, descriptive and concise, but he sometimes allows himself a looseness of expression that cannot be ascribed to transatlantic idiom. There are, too, occasional purple patches of decorative writing which are no adornment to a text-book. Printer's errors—e.g., "insiduous," "intractible," and "chorioditis"—are so numerous as to provide good material for a spelling-bee among readers. The book ends with a comprehensive and useful bibliography. If the student of the subject is prepared to disregard a host of minor sources of irritation, he will find much that is useful and instructive in this volume.

Digestive Tract Pain

By CHESTER M. JONES, M.D., Assistant Professor of Medicine, Harvard University; Physician, Massachusetts General Hospital. London: Macmillan and Co. 1938. Pp. 152. 10*s.* 6*d.*

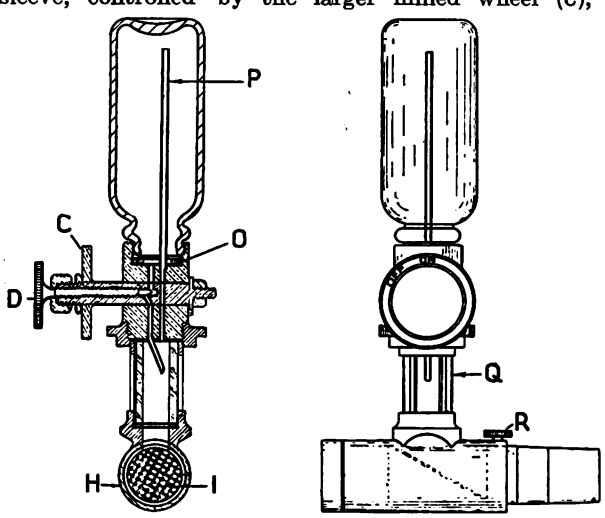
THIS well-printed and nicely bound volume contains a series of observations on patients with abdominal pain. The symptoms were correlated with the radiological findings and in many cases the diagnosis was established by subsequent operation. Preliminary chapters describe briefly the present state of our knowledge of the origin and localisation of pain arising from various sections of the alimentary canal, and the critical reader will perhaps find the book a further source of distress at our ignorance; for it is rarely possible to make anything like a dogmatic diagnosis from the mere analysis of symptoms, and any scientific tabulation of cause and effect is therefore out of the question. Unhappily, we have to face the fact that visceral pain is closely related to the personality of the patient and that similar lesions are liable to produce symptoms varying both in intensity and in localisation in different individuals. Diagnosis remains a matter of clinical acumen coupled with the proper use and evaluation of ancillary methods of examination.

NEW INVENTIONS

A DRIP-FEED FOR DIVINYL ETHER

THE drip-feed illustrated below has been designed for use on any type of Boyle or McKesson apparatus.

It can be carried, or left attached to the apparatus, without fear of the liquid escaping by evaporation or leakage. This is made possible by a revolving sleeve, controlled by the larger milled wheel (C),



which in the position "off" closes both the inlet and the drip outlet, when the attachment is not in use.

A standard-size bottle of divinyl ether is screwed firmly into the base, care being taken that the foil-covered washer (O) is in place. In this position the bottle, base, and sight-feed hang vertically beneath the tubular mount which attaches them to the machine. With the larger milled wheel (C) in the "off" position, not only is the bottle cut off from the sight-feed, but the sight-feed is cut off from this tubular mount, and added security is thus provided against unintentional contamination of gases flowing through the tubular mount from the anæsthetic apparatus to the face-mask. Divinyl ether has remained in the bottle for three weeks without any loss of volume.

When required for use, the apparatus is revolved on its tubular mount through 180° and is held in this position by the screw (R). The sight-feed is now in free communication with the tubular mount, with the bottle standing inverted above the mount. The larger milled wheel (C) is then turned counter-clockwise to "on." This opens the inlet, thus equalising the air pressure in the bottle above the fluid and in the tubular mount and sight-feed, and allows fluid to enter the drip outlet. The rate of drip is then regulated by means of the smaller milled wheel (D) which, turned counter-clockwise, increases the rate of drip and turned clockwise decreases the rate. Anæsthetic fluid drips through the glass chamber (Q) on to a metal gauze (I) in the tubular mount where it is vaporised by respiratory gases. The rate of drip having been adjusted, it can be interrupted at will by means of the milled wheel (C) without altering this adjustment.

I have used this attachment for the past 18 months with satisfactory results, mostly for divinyl ether but occasionally for ether and chloroform. It is especially suitable for closed anæsthesia, since fluids are volatilised with no resistance to breathing. It has been made to my instructions by Coxeter and Son, Morden-road, London, S.W.19.

T. A. B. HARRIS, M.B. Melb., D.A.,
Anæsthetist to Guy's Hospital, London.

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THE LANCET

LONDON: SATURDAY, JUNE 11, 1938

THE BORDERLAND OF LIFE

FOUR years ago most workers on viruses when questioned as to the probable nature of the filtrable agents they were studying would have replied with little hesitation that they were minute living micro-organisms. To-day this question would not perhaps be answered so confidently, though workers in this country at any rate still largely subscribe to the "living" theory. Their faith in it, however, has been a little shaken by the recent demonstration that certain plant viruses, more particularly the virus of tobacco mosaic and its variants, are peculiar proteins of very high molecular weight. Though before 1935 various investigators held that tobacco mosaic virus was probably a simple protein, it was W. M. STANLEY in America who in that year provided the first really solid evidence in support of this contention. And although the observations made at Cambridge by BAWDEN, PIRIE, BERNAL, and FANKUCHEN are in disagreement with STANLEY'S findings on one point—the possibility of obtaining the tobacco mosaic virus in the form of true crystals—in all other respects they are in full accord; tobacco mosaic virus seems to be a heavy protein of very large molecular size which can be obtained in a high state of purity without any loss of virulence. Both in America and this country rapid strides have been made in this aspect of plant virus research. The variants to which tobacco mosaic virus gives rise, as well as several other plant viruses, have been identified with heavy proteins, each virus protein being clearly distinguishable from the rest; the protein of one virus, that of bushy stunt, has been obtained by the Cambridge workers in the form of true crystals. Although there is still just a possibility that these proteins are not the viruses themselves, but an impurity in the form of pathological proteins resulting from the disease process with which the virus is associated, the available evidence strongly supports the view that the proteins are in fact the viruses. Some viruses, then, seem to be nucleo-proteins that can be obtained in paracrystalline or crystalline form and, according to accepted view as to what constitutes life, are non-living agents. And it is the bearing of this astounding new knowledge on the problem of the nature of viruses in general that is engaging the attention of virus workers throughout the world to-day.

Are we to abandon the idea that any of the viruses, even the largest animal ones, are living organised things and conclude that all viruses are non-living? Or must we assume that the big group of disease agents which we call viruses is really a heterogeneous collection comprising both living and non-living agents? There is a third possibility—to make more liberal our views on what constitutes life and to admit that as the result of adaptation to a parasitic existence a micro-organism may eventually lose all enzyme activity and become completely dependent on the cells it parasitises for all the factors necessary for its existence—a form of life without an independent metabolism. It is this conception which Sir PATRICK LAIDLAW puts forward in the Rede lecture for 1938 which he delivered recently at Cambridge.[1] He accepts the large viruses as minute bacteria. They have definite shape and size; they can reproduce themselves and retain their individuality irrespective of the cellular environment in which this multiplication takes place; and some of them have an antigenic complexity similar to that of bacteria. The only thing which they have not been shown to possess is an independent metabolism and it is not, as Sir PATRICK points out, their size which would prevent this, since the organism of bovine pleuro-pneumonia and the minute organisms which he and W. J. ELFORD isolated from sewage are of the same order of size as the large viruses and yet have demonstrable metabolic activities. Sir PATRICK is not prepared to accept the view put forward by STANLEY and others that those plant viruses which are simple proteins are autocatalysts. His objection is that this hypothesis presupposes the existence of a precursor substance in the susceptible cells from which the autocatalytic virus manufactures itself. A virus with a wide host range would require the presence of the specific precursor in the cells of quite unrelated species. The cells of the chorio-allantoic membrane of the developing hen's egg, susceptible to many viruses, would have to possess a whole range of precursor substances, which is hardly credible. Another objection to the autocatalytic hypothesis is that if the formation of a virus from its precursor were such a simple matter one would expect viruses to arise spontaneously in isolated communities from time to time and there is no evidence that this occurs. Further, if one accepts the large viruses like vaccinia and psittacosis as living micro-organisms and the plant virus proteins and possibly the very small animal viruses as non-living autocatalysts, where, Sir PATRICK asks, is one to draw the line? If, for instance, the virus of foot-and-mouth disease is to be placed in the non-living group, where is one to classify the virus of vesicular stomatitis which, though considerably larger, produces an identical clinical condition?

As Sir HENRY DALE concluded in his Huxley lecture three years ago, the virus group has to be considered as a whole. Either viruses are all living things or they are all non-living agents; to draw a line dividing the group into two classes of agent of such diverse character appears almost impossible. Finding himself in agreement with this conclusion, Sir PATRICK LAIDLAW puts forward the view that in the group of viruses we

[1] Virus Disease and Viruses. By Sir Patrick Laidlaw, F.R.C.P., F.R.S. London: Cambridge University Press. 1938. Pp. 52. 2s. 6d.

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have a collection of micro-organisms which have traversed the path of evolution towards the goal of complete parasitism to varying degrees. The large viruses would thus be those which had lost the power to synthesise one or two essential factors necessary for their life and had so become dependent on that cellular environment where these particular factors were to be found. And passing down the virus scale there would be the loss of more and more metabolic activities until one reached the smallest viruses bereft of all ferment activity, the "ultra-parasites" resigned to living a borrowed life. The very simplest form of virus would thus be micro-organisms which had lost everything except the ability to transmit the character of the species. It is, assuredly, a most attractive hypothesis but it leaves one point unexplained. If the very simplest form of virus which is represented by a simple nucleo-protein in molecular dispersion does not reproduce itself by autocatalysis, then how does it multiply? Does it do this by fission? If so, this is something quite foreign to our conception of the behaviour of molecules.

GENERAL OR SPECIAL HOSPITAL FOR MATERNITY?

CONCERN for the hard core of the maternal death-rate is leading, rightly or wrongly, to a great increase in the demand for institutional care. In three districts of New York City 80 to 90 per cent. of deliveries take place in hospital, and there is evidence that this figure may yet be equalled in this country. If Prof. MUNRO KERR had his way it would be exceeded. The discussion over which he recently presided[1] at the Royal Sanitary Institute, and a rather earlier (March 25th) discussion from a slightly different standpoint at the Royal Academy of Medicine in Ireland, show that informed opinion is exercised by the main problem, can the obstetric art be better practised at home, in a special hospital, or in a unit of a general hospital where its force is joined by other departments which assume for its purpose, and in the best sense, an auxiliary rôle?

The function of the maternity hospital is not simply the conduct of normal labour in healthy women. Were it so, separate housing would be the evident course to protect against infection. Antenatal and postnatal care and pædiatrics are obvious extensions of its responsibility. The system responsible for the climax of the confinement must also supervise events leading up to it and the subsequent rehabilitation; and this calls for the knowledge and practice of every improvement in the prevention and treatment of disease and disability in mother and child. These considerations led the Departmental Committee on Maternal Mortality and Morbidity (1932) to recommend the inclusion, wherever possible, of maternity units within general hospitals. Throughout his period of responsibility the obstetrician is called upon to deal not only with the "unruly waywardness" that pregnancy may cause in the organism, but also with "the imperfections of long ingrafted condition." Hence departments of medicine, surgery, orthopædics, pathology, dietetics, and radiology all form part of the ideal maternity service. Their lack cannot be compensated by the most devoted obstetric skill. The maternity unit of the general hospital has all these needs fulfilled under the one roof. Medical or surgical complications can be treated in convenient collaboration with specialists but with the obstetric significance of each development understood, and the ultimate decision governed by the department undertaking the final test, the actual delivery. The need for easily available specialist advice extends even into the labour theatre. Close contact with a radiological department is essential to the nice conduct of difficult cases and emergencies whose previous history is unknown. Our knowledge of the sources of hæmolytic streptococcus infections and the new chemotherapy have gone far to solve one problem of puerperal sepsis. There remains the other great cause of death and disability, the anaerobic streptococci. It may be that better understanding of the mechanism of labour will lessen this danger also. Radiography, by showing the available room in each type of pelvis, may to some extent prevent the trauma from blind manipulations which predisposes to infection.

In particular a pathological department should be at the service of a maternity unit, and this is the strongest argument for its association with a general hospital. The advantages that its bacteriological research department gives such a special hospital as Queen Charlotte's may well be unrivalled. For the average maternity service, even the faint shadow of such resources would be unobtainable unless it were incorporated with other departments to justify the appointment of a full-time pathologist. In the puerperium the obstetrician has to depend almost completely on the bacteriologist's report for the appropriate segregation of the emergency admission, the unbooked, the suspect, and the infected cases. The protagonist of the special hospital may protest that contact between the nursing staff of the maternity and other units of the general hospital will increase the risk of infection reaching the parturient or puerperal woman. It should be possible to ensure, however, that the staff of each unit have no contact while in uniform. The case for separate housing requires more study. While R. CRUICKSHANK has demonstrated that nurses in contact with cases of streptococcal infection in surgical wards show a considerable percentage of carriers, experience at Queen Charlotte's has been different. Investigations there have shown no significant difference in the incidence of carriers among the nurses of the entirely separate main and isolation blocks. Perhaps the difference lies in the care taken in the isolation block, by adequate masking of the nose and mouth, to guard against the development of carriers. At the British Postgraduate Medical School, among other similar institutions, it has been shown that the same principles are feasible in the maternity unit of a general hospital with an enthusiastic and instructed staff.

[1] See *Lancet*, April 30th, p. 1000.

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Most important of all is the continued responsibility of the obstetrician—in the antenatal, intrapartum, and postnatal care of the childbearing woman—for the application of the advances of modern medicine in every specialty. In the majority of cases the special maternity hospital will allow him to discharge this duty; the ancillary departments of the maternity unit within a general hospital will permit it in all.

THE SARCOIDOSIS OF BOECK

Boeck's sarcoid is familiar to most physicians as an uncommon and bizarre skin disease; but there is more and more reason to think of this skin lesion as merely one manifestation of a generalised morbid process. SCHAUMANN has been urging this broader view since 1914 and it is now generally accepted that the skin is affected in only about half the cases. Dermatological manifestations other than those described by BOECK—first as multiple benign sarcoids and later as miliary lupoid—are now admitted as part of the syndrome, the most important being lupus pernio, angiolupoid, and érythrodermie sarcoïdique. The other main localisations of sarcoidosis are infiltrations of the phalanges of the fingers and toes, producing a deformity resembling spina ventosa and the radiological picture known as Jüngling's osteitis multiplex cystica vel cystoides tuberculosa; lymphadenopathy and splenomegaly; pulmonary lesions with an irregular miliary distribution often associated with enlarged mediastinal and hilar lymph nodes; and iridocyclitis. Infiltrations may be found in almost any organ or tissue; enlargement of parotid and lacrimal glands has often been reported and BOECK himself wrote of the frequency of catarrhal symptoms due to mucosal lesions in the upper respiratory tract.

The histological characteristics of all the lesions are the same: they consist of a focal proliferation of histiocytes to form collections of epithelioid cells with an occasional histiocytic giant cell. There is usually no surrounding lymphocytic infiltration and caseation is not seen. The tubercle bacillus is not found in sections, and animal inoculations—with one or two dubious exceptions—have been consistently negative, though the morbid histological change is what was described by ZIEGLER as "hyperplastic tuberculosis" and what many pathologists still call "endothelial tubercle." Evidence that the lesions are due to mycobacterial infection is not forthcoming and the Mantoux test is often negative. There is a wrangle of long standing over the tuberculous origin of sarcoidosis which recalls the dispute about the ætiology of Hodgkin's disease, and a recent paper[1] has once again raised this question. A case of sarcoidosis occurring in the son of a formerly phthisical man is described; this boy had enlarged lymph nodes in the neck for five years and afterwards also in the mediastinum; biopsy showed the typical histology of sarcoidosis and the Mantoux test was negative. Later he developed overt pulmonary tuberculosis with a positive intradermal reaction—contact with a case of open tuberculosis was elicited—and he finally died from miliary dissemination. The authors show laudable caution and draw only the tentative conclusion that tuberculosis and sarcoidosis are in some way related. Reports of cases of this type are numerous and such observations have often been employed as an argument favouring the tuberculous ætiology of sarcoidosis. The fallacies in this reasoning need no demonstration and it is reasonable to regard the pulmonary tuberculosis as a secondary infection such as is acknowledged to take place in Hodgkin's disease and leucosis.

Any individual case of sarcoidosis may show lesions in one or more of the typical sites when first seen, but if it is kept under observation for a long time further lesions will appear and the earlier ones may retrogress. Symptoms of general intoxication, such as fever, loss of weight, and malaise, are often lacking and the course is extremely chronic with a tendency to spontaneous retrogression and recovery. It will be noted from the description we have given that if iridocyclitis and parotid gland enlargement are associated in the same case the symptom-complex known as uveoparotitis or febris uveoparotidea of Heerfordt will be produced. Lymphadenopathy and splenomegaly have often been described as occurring in this syndrome and the parotid gland shows the typical histological picture of sarcoidosis. Indeed recent reports[2] go far towards proving that uveoparotitis is no more than a clinical variant of sarcoidosis. It is interesting to reflect that it has required forty years of investigation to reveal the true nature of the latter disease. Even though its causation is still unknown it must now stand alongside Hodgkin's disease and leucosis as one of the systematised proliferations of the lymphoreticular tissue—in the jargon of morbid histology, a histiocytic sinus reticulosis.

IT would be ungrateful to allow Prof. SIGMUND FREUD to make our country his future home without bidding him welcome. His teachings have in their time aroused controversy more acute and antagonism more bitter than any since the days of Darwin. Now, in his old age, there are few psychologists of any school who do not admit their debt to him. Some of the conceptions he formulated clearly for the first time have crept into current philosophy against the stream of wilful incredulity which he himself recognised as man's natural reaction to unbearable truth. Others have been discarded by all but a loyal band of psycho-analysts, and still others have been developed, extended, and altered so much as to make them hardly recognisable. FREUD comes to us at a time when one at least of his classic works is available to anyone who has 6*d.* to spend, and the audience to which he thus speaks directly is limitless. This is not the time to appraise his contribution, but to greet him in the hope that he may find peace and some joy among his many friends and admirers in London.

[1] With, T. K., and Helweg-Larsen, P., *Acta med. scand.* 1938, 95, 92.

[2] Longcope, W. T., and Pierson, J. W., *Bull. Johns Hopk. Hosp.* 1937, 60, 223; Slot, W. J. B., Goedbloed, J., and Gosling, J., *Acta med. scand.* 1938, 94, 74.

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ANNOTATIONS

HEALTH RISKS OF CINEMA OPERATORS

IN the projection of moving pictures in present-day cinema houses, the source of light is the carbon arc. It has long been known that an electric spark in air will form nitrous fumes and the toxic effects of such fumes are well known. It seems high time therefore that attention was paid to the conditions of ventilation under which cinema operators work. Unless these are good the operator will be exposed both to excessive heat and to nitrous gases. Qualitative and quantitative analyses of these gases, as reviewed on p. 1348 are by no means reassuring, and Philip Drinker and Snell[1] have done well to consider the precautions that ought to be taken. They find that the heat output of the carbon arc in the cinema projection lamp is about 160 British thermal units per minute, and the temperature at the entrance to the lamp flue reaches 300° F. after the arc has been burning for half an hour. When two lamps are used alternately, as is the practice in cinema booths, about one-sixth more heat is generated—i.e., 187 B.t.u. per minute. Efficient ventilation both of the lamp flue and of the room itself is therefore needed to make the temperature conditions reasonably comfortable for the operator, and the experiments of Drinker and Snell showed the great advantage of having a high rate of air movement in the lamp flue, as a means of diminishing both heat and fumes. The investigators conclude that if the ventilation of the lamp and the room will dispose of the heat from the arc, it will at the same time remove the harmful products of combustion. They recommend that the flue pipe from the projection lamp should be ventilated at a minimum rate of 12 c.f.m.—preferably at 50 c.f.m.—and that the room or booth itself should be connected to the air-conditioning system of the theatre; or if such a system is not available, the booth should be ventilated at a rate (about 20 to 30 air changes per hour) sufficient to maintain a comfortable temperature. In such places as the large Hollywood motion-picture stages, where it is impossible to put flue pipes on the projection lamps, there should be enough general ventilation of the stage to remove the heat and the products formed by the carbon arc electrodes.

BACTERIOLOGICAL CULTURE OF THE BONE-MARROW

Seyfarth, in 1923, appears to have been the first to examine the bone-marrow during life, his object being to obtain information about the types of cells present in certain diseases of the blood. To this end he removed a small disc of bone from the sternum, and this amounted to a minor surgical operation, with all its attendant disadvantages. In 1929 Arinkin introduced a special cannula fitted with a needle for sternal puncture, and thereby made the withdrawal of bone-marrow from the sternum a comparatively simple process. Though widely used in hæmatological work, this method has only lately been introduced into clinical bacteriology; but a few observations have already been made by different workers on the frequency of bacteria in the bone-marrow in a number of infective diseases. One of the most recent explorers of this field is Barbagallo,[2] and using Baserga's modification of Arinkin's needle and cannula, he has practised puncture of the sternal medulla in 21 cases. The technique he employs consists in sterilising the skin over the upper part of the sternum, anæsthetising it with an ethyl chloride spray, and then injecting Stovaine in the neighbourhood of the periosteum. The puncture itself is made about the level of the second intercostal space. Under firm pressure the needle and cannula enter the anterior bony plate of the sternum and then slip easily through the cancellous tissue underneath. The needle is removed, a syringe is attached to the cannula, and some of the medulla is withdrawn by suction and inoculated directly into suitable liquid media. The cannula is then taken out and the puncture wound covered with a simple dressing. Stovaine acts very rapidly, and the whole operation, except for the actual withdrawal of the bone-marrow by suction, is apparently painless. The 21 patients examined comprised 1 suffering from infective endocarditis, 6 from undulant fever, and 14 from typhoid fever. Altogether 34 examinations of the sternal medulla were made on these patients, together with simultaneous blood cultures. The causative bacterium was isolated from 8 of the 34 blood cultures and from 21 of the medullary cultures. The difference in favour of the latter method is fairly striking. It may be noted that nearly all the positive cultures were obtained from patients whose temperature was 99·5° F. or over. Barbagallo sees no reason why medullary culture should not be introduced into current hospital practice. Experience alone, however, will show whether its superiority over blood culture is sufficient to justify the greater inconvenience caused to the patient.

IS TULARÆMIA CONVEYED BY MOSQUITOES?

A SERIOUS outbreak of tularæmia in Sweden last year led to an epidemiological study by Dr. Gunnar Olin[1] of the State Bacteriological Laboratory in Stockholm. This outbreak, with 115 cases, was the third and most serious to overtake Sweden; 31 persons were affected in 1931, 48 in 1934, and none in the intervening years. Only 3 of the 115 cases could be linked up with the handling of a diseased hare; this had been found half-dead and fed to foxes in a fox farm whose occupants were, apparently, none the worse for this particular meal. In a fourth human case, the handling of a rat found dead might possibly explain the mode of infection, but in the remaining 111 cases a less direct process of infection had to be sought, and Olin has carefully weighed against each other the claims for contact infections between human beings, and infections by biting insects. He prefers the latter, and notes in support of it that in all three outbreaks the incidence was highest at the same time of the year—i.e., in the autumn. Pointing in the same direction were the facts that rural areas suffered more than towns and that females suffered more than males (65 : 50), the surface of the body available to biting insects being considerably greater in females than in males. Then again there was a substantial decline in the number of cases from the middle of September onwards. Had the infection spread directly from one person to another, there would have been several families with more than one case in each, but there were only three such families. The position of the so-called primary lesion was also suggestive of an insect vector

[1] Drinker, P., and Snell, J. R., *J. industr. Hyg.* April, 1938, p. 289.
[2] Barbagallo, G., *Policlinico*, sez. med. 1938, 45, 230.

[1] *Hygiea*, April 5th, 1938, p. 236.

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of the disease, for among 97 cases of the ulcero-glandular form of it the legs were involved in 57, the arms in 15, and the face or neck in 25. This predilection for the legs, with more female than male cases, is linked up by Olin with the fact that in the summer Swedish women go bare-foot. In the 15 cases in which the arm was the seat of the primary lesion, it was the forearm rather than the upper arm or hand which suffered.

American workers have already shown that ticks and biting insects can transmit tularæmia from animals to man, and Olin produces evidence of severe mortality among the hares in the affected districts of Sweden. As the link between hare and man he dismisses ticks on the somewhat slender ground that persons bitten by them would be sure to remember their affliction. A horse-fly, *Chrysops discalis*, is a known vector but he could find only two persons in the series who recalled being bitten by horse-flies at a relevant time. This, he thinks, narrows the indictment down to mosquitoes, of which four species of aedes and one of theobaldia have been shown to transmit infection to guinea-pigs. Unfortunately bad weather prevented direct examination of mosquitoes for tularæmic infection and no animal experiments seem to have been undertaken. Hence Olin's indictment of some stinging insect, probably a mosquito, rests at present on circumstantial evidence. It will be noted that the three epidemics of tularæmia from which Sweden has suffered have been at three-year intervals and this periodicity may be explicable by the recovery of the wild rodent population, decimated after an epizoötic of tularæmia, to a level at which another epizoötic can begin. The infection has been shown to be endemic in the rodent population in certain parts of Sweden, but human infection is apparently limited to the time of an epizoötic.

THE APICAL LEAD IN THE DIAGNOSIS OF CARDIAC INFARCTION

IN electrocardiography it is now part of the routine to take a tracing with an electrode placed over the apex-beat (Lead IV), and it is recognised that in some cases of cardiac infarction this lead gives more information than the limb leads. With a more or less incomplete clinical picture and equivocal changes in the electrocardiogram of the limb leads, a definite diagnosis may yet be made from characteristic changes in the apical lead. Thus Sprague and McGinn [1] found that in 16 of 92 cases of coronary thrombosis, recent or old, Lead IV gave evidence not apparent in the three limb leads. The infarcts were all of the anterior type, and it is in this, rather than the posterior, type that the superior value of Lead IV has been demonstrated. In this study the right-arm electrode was placed over the apex and the left-leg connexion was used as the indifferent electrode; hence the waves were in the sense opposite to what would be obtained by the method now generally practised, with which the T wave is normally upright. Expressed in terms of the Lead IV now officially recommended [2] and generally used, the main changes in Lead IV after acute infarction were absence of the R wave, upward displacement of the S–T segment, and a diphasic or negative T wave. The changes characteristic of infarction may persist in Lead IV when they have more or less disappeared from the limb leads, and Sprague and McGinn had 10 such cases, in 6 of which the limb leads were suggestive but not diagnostic of infarction. Clinical details and tracings of 4 cases are given, and in all these the diagnosis of cardiac infarction could be made, with little room for doubt, from the symptoms and from the limb-lead tracings. But the changes of Lead IV are certainly more conspicuous.

[1] Sprague, H. B., and McGinn, S., *New Engl. J. Med.* March 31st, 1938, p. 555.
[2] *Lancet*, Jan. 22nd, 1938, p. 221.

SACROCOCCYGEAL SINUS

THE sinus or fistula of congenital origin sometimes found in the region of the coccyx is one of the most troublesome of minor surgical complaints. Apart from the agreed fact that it is congenital, its pathology has not been altogether clear. The sinus tract commonly leads to a cyst, and it is uncertain whether cyst and sinus arise from the neurenteric canal or are the result of ectodermal invagination. Rogers and Dwight,[1] in examining some 400 cases, have never seen a sinus communicating with the neural canal, and McKirdie [2] also believes that the weight of evidence is in favour of the invagination hypothesis. This is not mere idle speculation, for the condition is difficult to treat and when it recurs the suggestion may be made that the excision was too limited. If the surgeon believes in the neurenteric origin of the sinus he will feel justified in removing the coccyx and carrying the excision up to the sacrum, whereas if he believes that the sinus arises from the skin he will avoid unnecessary exposure of the deeper tissues with its risk of infecting a large raw area.

It is the liability to recurrence that causes most trouble. McKirdie, who reports 22 recurrences in 87 cases, has come to the conclusion that the essential factor is infection, and the formation of sinuses from infected tissue. Emphasis on the danger of leaving behind remnants of sinus has led to unnecessarily wide excisions; the usual type of sinus tract lies along the midline and can be eradicated by excision of a comparatively small block of tissue. What is important is to leave no dead spaces and to ensure complete hæmostasis; wide undercutting laterally exposes further tissue to infection, and sinuses may result in the scar which are mistaken for evidence of lateral extension of the tract. Rogers and Dwight have had great success with cautery excision, which they perform under local anæsthesia with Novocain except where they anticipate special difficulty. They use open packing and aim at sound healing by second intention, reserving primary closure for cases where there seems a fair chance that infection is slight and where, in order to shorten the healing-time, the added risk seems justifiable. McKirdie believes that the wound should be closed if the surgeon feels reasonably sure that it is not grossly infected. Of his 87 cases, 68 were treated by suture and drainage, though partial closure with a gauze pack was used in a few. In his view drains should be inserted at the upper angle, never at the lower, and he advocates wide open packing where there is gross infection, provided conditions allow of post-operative care by the surgeon himself. Ambulatory treatment probably gives better results than treatment in bed if the dressing is well secured during defæcation and the buttocks are strapped to prevent excessive movement during walking.

The term pilonidal sinus, by which the sacro-coccygeal sinus is sometimes known, refers to the hairs embedded in the cyst. Hairs are not often

[1] Rogers, H., and Dwight, R. W., *Ann. Surg.* March, 1938, p. 400.
[2] McKirdie, M., *Ibid*, p. 389.

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found when infection is of long standing, for in such cases the original squamous epithelial lining is replaced by granulation tissue. *Staphylococcus aureus* and *albus* are the usual infecting organisms. It is noteworthy that in their extensive experience Rogers and Dwight have never seen cancer develop in one of these sinuses.

THE SEQUELÆ OF CERTAIN OPERATIONS FOR PROLAPSE

THE plastic surgery of genital prolapse is just over 100 years old. During that time great advances have been made, both in knowledge of pelvic floor anatomy and in the details of surgical technique. The operation is now a commonplace of gynæcology and its risk and complications tend to be overlooked. One of them was noted by Mr. Bryan Williams in a recent communication to the North of England Obstetrical and Gynæcological Society.[1] He reported that in a series of women in whom cervical amputation was combined with colporrhaphy, no less than 28 of 49 subsequent pregnancies ended in abortion. This danger following high amputation of the cervix has long been known though probably not sufficiently respected; but it is only fair to point out that the high incidence of abortion in this particular series may be partly due to the fact that the 49 pregnancies occurred in only 37 patients. The danger of subsequent abortion depends also on the height at which the cervix is amputated; most gynæcologists believe that amputation at a reasonably low level is not followed by an unduly high abortion rate. This should be borne in mind, since adequate vaginal repair is often impossible without simultaneous amputation of some part of the cervix. Other risks of prolapse operations are often ignored; even the case-mortality rate, although low, is not negligible; a rate of 1 per cent. has been, but in practice is not often, attained. Pulmonary embolism, cardiac failure, cerebral thrombosis, septicæmia, peritonitis, and anæsthetic deaths all take their toll. The desirability of careful selection of cases and of rigidly aseptic operative technique need hardly be emphasised.

The commonest complaints made by patients after the operation are of dyspareunia, "stress" incontinence of urine, and persistent discharge; these sequelæ are nearly always attributable to faulty operative technique. Dyspareunia may be serious. A recent analysis of "follow-up" records, not yet published, has shown that about one patient in five complained of dyspareunia during the year following the operation, and that in half these cases the disability was permanent. In some of them intercourse was said to be impossible. The technical skill of the operator will of course affect the results; but however technically perfect vaginal repair may be, the patient is liable to experience difficulties and disappointments unless she is given definite information and advice before leaving hospital. She should be told that as a result of the operation her pelvic floor is restored to something resembling its virginal state and that the vagina has been considerably narrowed. If this fact is also kept in mind by her obstetrician during any subsequent pregnancy, there is usually no reason why delivery should not be safely conducted. In such cases Mr. Williams advocates more extensive use of episiotomy during the second stage of labour. The incision is easily stitched, usually causes no further trouble, and it is exceptional for the prolapse to recur. Mr. Williams's view that women of child-bearing age should not be subjected to extensive operations on the cervix uteri will be shared by most experienced gynæcologists.

[1] See *Lancet*, May 21st, 1938, p. 1168.

RADIOLOGICAL ANATOMY

MOST anatomy departments in Great Britain are now equipped with X ray machines, possess a library of films illustrating every part of the body that can be explored by radiological methods, and give systematic courses of instruction in anatomy as seen under X rays. The diagnostic uses of a radiological plant were manifest long before it became generally realised that this method of making visible the normal anatomy of the body would be invaluable for routine teaching. Those who were anxious to employ it had first to overcome the dogma that the only place in which anatomy can be properly taught is in the dissecting-room. Next, the money for the apparatus and for the salary of a radiographer had to be got out of reluctant and impecunious authorities who were not easily persuaded that it is now essential to provide more in an anatomy department than subjects and facilities for dissection and an adequate museum. The most difficult matter of all has been to secure as demonstrators men who are not only conversant with normal radiological appearances and are technically qualified to get the utmost value out of their apparatus but are also expert anatomists. Where these things have been achieved there still remains the need of a text-book which, in addition to describing the technical aspects of radiology, relates the results of X ray investigation to what can be learnt on structure by dissection. One now to hand,[1] by two professors of anatomy and a radiologist attached to the same hospital as one of them, should meet this need. It contains three hundred illustrations of real merit, many in colour, and is issued at a price within the reach of any student. In general the plan followed has been to give an excellent photograph of the external form of a region; then the form of the same region in terms of muscle after removal of the superficial tissues, and then a radiological analysis of the part. Much other information such as segmental innervation, times of ossification, the anatomy of lymphatics, and the like has been included in the book, which provides also instruction in the methods used for radiological examination of various parts of the body in clinical practice and those which involve the use of various scopes, including the gastroscope. A monograph on anatomy from a new angle provides a telling answer to those who assert that this more than any other subject in the curriculum is now overweighted with tradition.

DERMATOLOGY AS A DEVELOPING SCIENCE

DERMATOLOGISTS used to be accused of an unscientific approach to their subject and of cloaking ignorance of causation by the use of an elaborate nomenclature for classifications that were not fundamental. The emergence of the specialty from this descriptive stage has been a slow business, but the studies published during this century bear witness to the immense amount of work being done all over the world to establish a scientific basis for the study of diseases which affect the skin. The harvest to date

[1] Surface and Radiological Anatomy. By Arthur B. Appleton, M.A., M.D.Camb., professor of anatomy in the University of London at St. Thomas's Hospital medical school; William J. Hamilton, M.D.Belf., D.Sc.Glasg., F.R.S.E., professor of anatomy in the University at St. Bartholomew's Hospital medical college; and Ivan C. Tchaperoff, M.A., M.D.Camb., D.M.R.E., assistant radiologist to St. Thomas's Hospital. Cambridge: W. Heffer and Sons. 1938. Pp. 311. 15s.

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is by no means negligible. The problem of syphilis has been at least partly solved and much progress has been made in elucidation of the pathology of tuberculosis of the skin in its various forms, of leprosy, and of epithelial cancer. Knowledge of the genesis of eczema has been widened and increased by the discovery of the large group of pathogenic fungi and yeasts, the effects of dyes and other allergising agents, and the contributory association of abnormal metabolic states, such as diabetes, gout, and hypercholesteræmia. The skin provides a convenient and accessible site for the study, for example, of vascular physiology and pathology, of experimental carcinogenesis, and of localised bacterial infections, and the dermatologist whose vigilance does not extend over the whole range of medical publications may well miss advances highly relevant to his own work. A new journal,[1] the official organ of the Society for Investigative Dermatology founded in New York last year with Dr. George M. McKee as president, has been started in order to help dermatologists to keep in close touch with researches on the skin, its functions and its reactions, normal and pathological, to various stimuli, as contrasted with purely clinical reports. The hope is expressed that contributions on immunology, allergy, biochemistry, cancer, genetics, bacteriology and mycology, endocrinology and metabolism to mention only a few of those suggested as suitable will be submitted for publication. The journal will be published six times a year. The first issue contains articles on the experimental production of xanthomas by Fritz Schaaf (Zürich); on the local and systemic effects of topical application of various sex hormones, using the nipple test as a criterion, by W. Jadassohn, E. Uelinger, and A. Margot (Zürich); on relationship between chemical structure and properties and sensitising capacities in the production of eczematous sensitivity in man, by the editor of the journal, Marion B. Sulzberger, and Rudolph L. Baer (New York); and on the effect of allergic and histamine wheals on the rate of absorption of dyes and blood from the human cutis, by H. A. Abramson and Margery Engel (New York). The associate editors of the journal are S. William Becker, J. Gardner Hopkins, and S. M. Peck. An unusual rule for contributors is that the titles and names of authors and the institutions where the work was carried out must appear on a separate first sheet, in order that advisory editors shall judge the merits of the text without being able to identify the authors.

LOCAL FLUID-LOSS AND SHOCK

THE hypotensive effects of severe trauma have been variously attributed to toxæmia, to fluid-loss, and to nerve impulses. Essentially there is a decrease in the amount of blood in circulation, and this must be a consequence either of vasomotor paralysis or of oligæmia. Bell, Clark, and Cuthbertson[2] report experiments that point once more to loss of fluid into the damaged tissues as the main cause of the fall in blood pressure. There appears, as they say, to be a critical level of pressure (about 80–90 mm.) which the organism tries to maintain, and death comes rapidly if it falls further. The experiments now described are of two kinds—viz., trauma to the thigh muscles of anæsthetised cats, with observations of the blood-pressure readings until death; and cross-circulation experiments in which the traumatised limb was cut off from its normal circulation and connected with that of a donor animal; so that any fluid-loss occurring locally in the limb affected only the donor. In the first group of experiments the traumatised animals showed a big fall of blood pressure and died within 100 minutes. In the second group the blood pressure of the traumatised animal was almost unaffected, whereas the blood pressure of the donor animal fell sufficiently to cause death within 75 minutes. Bell, Clark, and Cuthbertson nevertheless confirm the finding of O'Shaughnessy and Slome[3] and others that interference with the integrity of the nervous paths to the injured limb will prevent or delay shock. Trauma was applied to animals whose limbs were disarticulated at the hip-joints in such a way that they were connected with the body only through the iliac vessels, the vascular sheaths of these being cut across. After the application of severe trauma to these isolated limbs there was no appreciable fall of blood pressure until an hour had elapsed. O'Shaughnessy and Slome concluded from their experiments that the passage of nerve impulses induces the shocked state. Bell and his collaborators, however, have to explain death in a donor animal in which the nervous path from the injured limb does not exist. They suggest that the intact nerves in the traumatised tissues influence the action of a substance produced locally and causing local fluid-loss.

INDUSTRIAL HEALTH AND SAFETY

IN everyday life there is a clear connexion between certain types of accidents and health. Such accidents happen when we are careless, and carelessness results from physical ill health or the preoccupation of an over-anxious mind. In an address which he gave recently to the Tees-side Industrial Safety Committee Dr. H. E. Collier emphasised that the same connexion applies to industrial accidents, and it is only by realising this that further progress in accident prevention is likely to be made. The safeguarding of machines has been carried to such a pitch of perfection that no great advance is likely in this direction, and the legal control of risky procedures laid down in the safety clauses of the new Factory Acts can hardly be bettered. The potential causes of accidents are of two classes: the dangerous situation, and the dangerous person. The former is the special concern of safety workers, and it is for them to see that all forseeable and preventable risks are removed. The latter is the concern of the medical profession. The ultimate success of accident prevention depends upon the efficient coördination of these two "specialisms."

The main contribution that medicine has to make to the cause of industrial safety lies in recognising and dealing with the workman who is abnormally prone to accidents. Such a man may be permanently accident-prone by reason of illness—he may be epileptic, mentally defective, blind, or crippled by heart disease—or he may be only temporarily accident-prone. Proper occupational selection based upon a competent medical examination will remove the former to a place in industry where the risks of accident are slight or absent; the temporarily accident-prone workman is a more important and more difficult problem, but one which an efficient industrial diagnostic service of trained medical men might do

[1] The Journal of Investigative Dermatology. Vol. 1, No. 1. February, 1938. Baltimore: Williams and Wilkins Co.; London: Baillière, Tindall and Cox. £1 9s. per volume.

[2] Bell, J. R., Clark, A. M., and Cuthbertson, D. P., *J. Physiol.* 1938, **92**, 361.

[3] O'Shaughnessy, L. F., and Slome, D., *Brit. J. Surg.* 1935, **22**, 589.

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much to solve. Dr. Collier divides the causes of temporary accident-proneness into those which are personal to the worker and those which affect all the members of a working group; and again into those which are physical and those which are mental in origin. In investigating an accident the first question is therefore whether it was an isolated occurrence or one of a series happening in one shop or in one type of work throughout the factory. Next whether the accident was due to a preventable dangerous situation, such as a faulty guard on a machine, to lack of experience or proper teaching of the workman, or to a manifest fault or apparently careless error on his part. If the cause is one affecting a group, inquiry must be made into such physical matters as ventilation and adequate working space, warmth, light, and the possibility of toxic materials being present in the atmosphere. Two important classes of industrial poisons to which workers are much exposed in modern industry, although they may not cause either death or serious illness, produce vague ill health and accidents which are easily attributed to carelessness; these are the narcotics and the blood poisons. The narcotics include the industrial solvents, such as trichlorethylene, amyl acetate, carbon tetrachloride, benzene and the like, alcohol, and the coal gases. Their typical symptoms are headaches, lassitude, irritability, and bad temper, but, as is familiarly the case with alcohol, the sufferer from such poisons often notices nothing amiss. In the blood poison class are benzene and carbon monoxide, of which the latter is especially important because it produces a feeling of utter irresponsibility and indifference to danger of which its victim is quite unconscious.

The psychological causes of accident-proneness are legion. Amongst the personal causes are fear, anxiety, over-conscientiousness, domestic worries, and a feeling of insecurity. Some of the more important group causes are social rather than industrial in origin, and depend upon improper feeding, long journeys to work, poor housing, lack of sunlight, and so on. Others are definitely industrial, and can be checked by ensuring continuity of employment, security, the provision of work-incentives, and, most important of all, by the creation and maintenance of harmonious relations within the working group or team, and by putting and keeping the right person in the right job.

VENEREAL DISEASES AND COMPULSION

LAST year the Ministry of Health sent a small group of medical and administrative experts to Scandinavia and Holland to study the measures taken in those countries against venereal diseases. The report of Colonel Harrison and his colleagues, which is reviewed on p. 1352, deals instructively with a difficult subject, and it may seem ungrateful not to accept immediately its main conclusion that Scandinavian results are similar to our own and that compulsion in treatment therefore cannot be a major factor in securing success. It will be questioned, however, whether this conclusion is justified while there are still so many gaps in the available information, and while adequate standards of comparison are lacking. It certainly appears that there has been a decline in the incidence of syphilis in all the countries concerned, but critics can fairly argue that the answers to one incomplete questionnaire form insufficient evidence as to the state of affairs in Holland, while the data for this country are obtained only from those treatment centres that are subsidised. Without similar figures from other treatment centres, from general hospitals, and from practitioners, the figures published in the report of the chief medical officer of the Ministry of Health must be regarded as a useful index of relative incidence rather than as a guide to the total incidence of the venereal diseases. Unless or until some reliable system of notification is introduced we shall be unable to ascertain the exact situation in this country. It is none the less important to have information about what is being done abroad.

EVACUATION OF CITIES IN WAR

THE Ministry of Health has now been given responsibility for the right use of hospitals if war is waged on this country from the air, and it will be seen from our Parliamentary columns that the evacuation of casualties from London is under close consideration. An even more fundamental problem is the evacuation of non-combatants—and especially children—from threatened areas. On May 14th we quoted Prof. J. A. Ryle's proposals for the "adoption of city boroughs, districts, and streets by counties, small country townships, and villages." By Dr. Ryle and others suggestions have been made for registration of all possible accommodation in rural districts, and for voluntary organisation and execution of this work of salvation. As an alternative to adoption of children by districts comes Mr. R. M. K. Buchanan's scheme for camp schools,[1] to be established at once and expanded later if necessary to receive the two or three million children living in "target areas." Children, parents, and teachers are to get to know the schools in advance:—

"The main idea is to create them now in suitable places well away from any point of military importance to which the children and teaching staffs could be transferred *en bloc* for a month during each school year. By this means ten or more schools would visit each camp during one scholastic year, where the general education of the children would continue as at present with little or no alteration in their curriculum and under their own teachers. In a national emergency it would be necessary to increase the accommodation of these Camp Schools from 500 to 5,000 children, but since the two main services of water and sanitation would be laid down for the maximum number when the camp was prepared this difficulty is not an insurmountable one."

Mr. Buchanan's wish is to ensure that good shall be brought out of evil; for a month's camp life, with sound food, regular hours of sleep, and discipline would, he believes, give health and strength to many of the boys and girls of our cities.

THE LANCET WRAPPER

THE Proprietors express regret to the subscribers who have experienced difficulty in opening their copies during the past few weeks. With the issue of June 18th a new wrapper with a tearing strip is being used; this it is hoped will prove entirely satisfactory. We thank those readers who have kindly written and offered suggestions to overcome the annoyance.

[1] *Time and Tide*, May 28th, 1938, p. 747.

MIDDLESEX HOSPITAL.—Dr. T. H. Sanderson-Wells, an old student of the hospital who formerly practised at Weymouth, has endowed a lectureship at the medical school. It is his wish that the lectures should cover the field of the relationships between rheumatism and dietetics. Dr. Sanderson-Wells will deliver the inaugural lecture on Monday, June 20th, at 4 P.M. at the hospital. The second lecture in 1939 will be given by Sir Robert McCarrison.

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SPECIAL ARTICLES

MEDICINE AND THE LAW

Legal Liabilities in Institutional Service

HOWEVER the action against the Lancashire Mental Hospitals Board may be decided, the case will be a reminder of the possible liabilities of medical officers in mental hospitals. The Royal Medico-Psychological Association has recently taken counsel's opinion upon the general position. It is clear that these doctors owe a legal duty to the inmates to use reasonable care in their treatment and detention and in giving leave of absence or in exercising any other function in the course of the daily round. It is understood that counsel have advised that, if the generally accepted treatment is to give the mental patient more and more freedom from supervision as he improves, then the medical officer will not be deemed guilty of negligence in adopting this form of treatment in the absence of special circumstances. The trouble is that negligence is a question of fact for the jury, and juries, however carefully directed by the judge, are prone to sympathise with a plaintiff and to reach conclusions in the light of facts not known to the medical officer at the time. Though the doctor owes the duty of reasonable care to the patient in the first instance, counsel have naturally had to consider whether a member of the general public has not also a right of action in the event of a dangerous lunatic or defective being negligently allowed at large. This issue arose in the case of Holgate *v.* Lancashire Mental Hospitals Board and others. Counsel have pointed out that in Everett *v.* Griffiths (1920) Lord Justice Scrutton observed that the restraint of liberty under the Lunacy Act might be imposed not only for the sake of the person detained but also for the sake of protecting the community. There seems consequently to be no doubt in counsel's mind that, where a dangerous patient is allowed to be at large through want of care on the part of a medical superintendent, a member of the public who is injured by the patient can claim damages from the medical superintendent. This is an important point which the Royal Medico-Psychological Association has usefully emphasised. The prospective plaintiff must obtain the leave of the court to sue and the court must not give leave unless satisfied that there is ground for thinking that the prospective defendant has acted in bad faith or without reasonable care. A further point on which the Association has obtained advice is the question whether the medical officer has any right to claim an indemnity from the local authority. Counsel's opinion on this issue is not encouraging. The local authority itself is not liable to the person injured if it has exercised reasonable care in selecting its medical staff. If the local authority has somehow, by itself or through its servants, been guilty of negligence causing or contributing to the damage, then the medical officer may be able to claim contribution or indemnity from the local authority under Section 6 (1) (*c*) of the Law Reform (Married Women and Tortfeasors) Act of 1935. This is the only possible chance for the doctor to be indemnified unless he has a special bargain to this effect with the local authority. He can of course insure himself with an insurance company or he can (as he certainly should) join one of the medical defence societies. In this connexion there is something worth noting in the recent annual report, just presented, of the London and Counties Medical Protection Society. The report mentions that the British Medical Association has felt it necessary to incorporate in its model rules for public medical service a stipulation that applicants for membership (which is confined to medical practitioners) must produce evidence of membership of a protection society. Public health is a wide field and the doctor's liabilities may be serious and unexpected. The London and Counties Society can point to a recent illustration of the striking benefits of membership. In a district not named in its report but easily to be guessed there were two or three cases of typhoid fever in the autumn of 1937. The medical officer of health had no occasion for grave anxiety at this stage, but presently other cases were notified and an epidemic involving 300 patients and several deaths attracted wide publicity. The Ministry of Health was persuaded to hold a special inquiry which lasted for 17 days. The medical officer had to submit to prolonged cross-examination. His membership of the society secured for him the benefit of being separately represented by counsel at the inquiry. His interests were well looked after at the society's expense and the story ended happily for him inasmuch as the tribunal completely exonerated him.

Claim for Negligence against Mental Hospital

In 1930, when memories of cases like Harnett *v.* Bond were still fresh and there was genuine consternation at the colossal verdicts which might be awarded against doctors under the existing lunacy laws, the Mental Treatment Act made an attempt to place obstacles in the path of plaintiffs. The High Court was not to give leave to bring an action unless it was satisfied that there was substantial ground for the contention that the persons whom it was sought to sue had acted in bad faith or without reasonable care. In Shoesmith *v.* Lancashire Mental Hospital Board the protection offered by the 1930 Act has been illusory. The facts, as briefly outlined in court, were that an inmate of the Calderstone Institution escaped last October and seriously assaulted a young girl. The Mental Hospital Board said that he was a man of good behaviour and had been on parole, thus enjoying the freedom of the hospital grounds. He had never been violent. His parole was withdrawn because of a technical offence, and while being taken to the refractory ward he escaped. The board contended that the hospital authorities had certainly not been guilty of "bad faith" and that, as regards "reasonable care," they had discharged their obligations. Mr. Justice Asquith, however, came to the conclusion that there was "substantial ground for the contention" that the hospital authorities had acted without reasonable care. He therefore declined to stop the girl's action. The Mental Hospital Board went to the Court of Appeal, where there was considerable discussion about the tribunal's jurisdiction to entertain the appeal. Two of the three lords justices thought there was jurisdiction; Lord Justice Greer, who presided, thought that there was no jurisdiction, but, on the other hand, he thought that Mr. Justice Asquith's decision was right. The appeal was dismissed. The girl's claim will therefore proceed on its merits at the assizes.

Divorce and Evidence of Insanity

A test case in the Divorce Court on June 1st raised the question of the propriety of the production of medical records by the Board of Control in cases

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under the Herbert Act. It was alleged by the husband that the wife was "incurably of unsound mind." The Official Solicitor appeared as guardian *ad litem* of the wife and asked that the Board of Control should supply him, before trial, with copies of all documents throwing light on her medical history. The Board of Control formally objected and was represented by the Attorney-General. The President of the Divorce Court intimated that, subject to considerations of public interest in particular cases, disclosure to both parties of the documents relating to the patient's medical history must unquestionably be in the interests of justice. The Attorney-General said that if the President thought that the disclosure would in proper cases be of assistance to the court, the Board of Control would give due weight to that opinion when considering any application. The court dismissed the Official Solicitor's application. The President made no distinction between the Official Solicitor and any other properly constituted guardian acting for a patient of unsound mind in respect of litigation. A fuller report of the President's observations will be awaited with interest.

The first cases requiring the judicial interpretation of the words "incurably of unsound mind" have now been heard. There has been a tendency on the part of the medical witnesses to distinguish between cure and recovery. The President of the Divorce Court has not encouraged the drawing of any subtle distinction. "Incurable," he said (in Swettenham *v.* Swettenham), means that which cannot be cured, incapable of being healed by medicine or medical skill; "unrecoverable" means incapable of being restored to health which is the definition of cure. The President said he could imagine cases where it might be necessary to examine the possible distinction more closely, but in the cases so far heard there was no need of any such research. In the Swettenham case, where the parties were of advanced age, the evidence was that the respondent, Lady Swettenham, had for five years and more been receiving the benefit of all that medical and nursing skill and treatment could do. It was common ground, said the judge, that at her age, after protracted illness, any more drastic treatment was out of the question. This was not a case of aggravated or violent insanity, but the court was satisfied that it had been proved beyond doubt, not merely by the fact of certification (which would not in itself have been enough) but by the medical evidence and the history of her illness, that the respondent was incurably of unsound mind.

GASES FROM THE CARBON ARC

CARBON-ARC electric lamps were first introduced mainly for street lighting, and because they were "safe by position" little attention was paid to the combustion products of the electrodes and their possibly toxic effects on human beings. They are now used, however, for the projection of cinematograph pictures, and the widespread development of the film industry gives practical importance to the nature and toxicity of these products. Carbon-arc electrodes are also employed in certain types of lamps designed for light therapy and Dadlez[1] in 1927 suggested the possibility that, in badly ventilated treatment rooms, oxides of nitrogen might form in quantities high enough to have a toxic action on the patients and on the operators. Again cases of poisoning by nitrous fumes are reported from time to time in welders (carbon arc, metallic arc, or oxy-acetylene) who have been working in confined spaces such as tanks or the holds of ships.

The April number of the *Journal of Industrial Hygiene and Toxicology* contains four papers bearing on the nature of the combustion products of the carbon-arc electrode. Coltman[2] confines his attention to analysis of the gases evolved during the burning of different types of electrodes, and Drinker and Snell[3] deal with the ventilation of motion-picture projection booths with particular reference to the disposal of heat and of the combustion products of the electrodes. (Further reference to this paper will be found on p. 1342.) MacQuiddy, Tollman, La Towsky, and Bayliss[4,5] describe both gaseous and particulate products of combustion of the carbon arc and also the toxic effects of the fumes on animals.

NATURE OF THE FUME

Carbon-arc electrodes are of three main types: (1) the plain, or low-intensity carbon arc, in which solid carbon electrodes are mainly used; (2) the flame arc, in which the carbon electrodes contain cores with relatively high amounts of metals or metallic oxides; and (3) the high-intensity arc, in which the positive electrode contains large quantities of salts, chiefly fluorides of the "rare earths."

When carbon-arc electrodes are burned in any type of lamp a fume is liberated containing gaseous and particulate matter. Coltman and MacQuiddy and his co-workers obtained largely similar results in their independent analyses of the fume, allowing for the fact that Coltman used many types of carbon-arc electrodes, whereas MacQuiddy studied the products of the high-intensity copper-coated electrodes used in the present-day cinema projection lamps. They agree that the only gas given off in toxic concentrations is nitric oxide (NO_2 or N_2O_4). Carbon dioxide is also formed in fairly large but not harmful quantities. With some types of electrodes Coltman found that small amounts of carbon monoxide are evolved, but MacQuiddy and his collaborators could detect no traces of it in their analyses of the fume from the high-intensity electrodes, and they draw attention to the technical difficulty of finding a specific indicator for CO in the presence of oxides of nitrogen. When the electrodes contain fluorides of the rare earths there is no evidence of the presence of fluorine or of gaseous fluorine compounds in the fume. Tests also fail to reveal the presence of SO_2, or of any gas reacting with silver nitrate such as hydrogen sulphide, phosphine, or arsine. Statements have been made that ozone is formed by the carbon-arc lamp, but neither Coltman nor MacQuiddy could find any trace of it. Coltman points out that ozone has an intense odour in small concentrations, and quotes Hill and Flack's statement[6] that there are no respiratory effects from ozone if the concentration is so low that it cannot be detected by smell. MacQuiddy and his co-workers maintain that up to the present time no satisfactory analytical method for the identification of ozone has been described.

In regard to the formation of nitrous fumes, Coltman finds that with any one type of carbon electrode, the amount of nitrogen fixation is approxi-

[1] Dadlez, J., *C.R. Acad. Sci., Paris*, 1927, 185, 420.

[2] Coltman, R. W., *J. industr. Hyg.* April, 1938, p. 289.
[3] Drinker, P., and Snell, J. R., *Ibid*, p. 321.
[4] MacQuiddy, E. L., Tollman, J. P., La Towsky, L. W., and Bayliss, M., *Ibid*, p. 312.
[5] *Ibid*, p. 297.
[6] Hill, L., and Flack, M., *J. R. Soc. Arts*, 1911–12, 60, 344.

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mately proportional to the arc current, but that the amount is affected very little by a change from direct to alternating current. Much higher quantities of fixed nitrogen, and therefore of nitrous fumes, are formed from plain and therapeutic electrodes (which contain iron, aluminium, and nickel) than from those which contain cores composed of the rare earths. The concentration of NO_2 in the lamp flue with an air flow of 5 cubic feet per minute varied from 200 to 1500 parts per million according to the type of carbon used and to the power of the electric current. In the experiments by MacQuiddy and his co-workers with a modern cinema projection lamp, NO_2 concentrations of 72–147 p.p.m. were actually obtained in the lamp flue when the air flow varied from 3·8 to 6·9 c.f.m., but it was calculated that the total concentrations would vary between 100 to 205 p.p.m. A concentration of over 40 p.p.m. is usually considered to constitute a risk to health.

As well as the gaseous products of combustion a fine dust is present in the fumes from the arc. The chemical composition of this dust varies with the type of electrode used, and with the high-intensity electrode was found to consist mainly of oxides (65·7 per cent.) and fluorides (10 per cent.) of the rare earths, with small quantities of the oxides of iron, calcium, and potassium. In addition some unburned carbon and small quantities of copper were found. The size of the particles was very small, ranging from 0·5 to 1·5 μ, but clumps of them measured as much as 7·5 μ.

ACTION ON ANIMALS

To test the effects on animals of inhalation of the fume from the carbon electrode, MacQuiddy [5] and his co-workers subjected different kinds of animals to (1) continuous exposure to the undiluted arc fumes; (2) exposure to similar fumes for one hour a day for a maximum of 10 months; and (3) exposure for four hours a day for a maximum of eight months.

In the first series most of the animals died after periods of exposure ranging from one to twenty-one hours, guinea-pigs and rabbits being the most resistant, and cats, mice, and rats succumbing rapidly to the fumes. It is an interesting point that spectroscopic examination of the blood in cats, mice, and rats showed the presence of methæmoglobin, whereas in guinea-pigs and rabbits oxyhæmoglobin was found. Congestion of the lungs was the main post-mortem finding in all animals living only for four hours, and in those which survived for longer periods pulmonary œdema was found. These changes are consistent with a diagnosis of death from the inhalation of nitrous fumes and with clinical observations in human beings as to the delayed onset of œdema of the lungs after exposure to nitrous fumes or to phosgene. In the second group exposed to the arc fumes for 1 hour a day for 10 months, guinea-pigs showed no pathological changes in the blood or internal organs, but under the same conditions albino rats died after 11–32 weeks with post-mortem changes of acute, subacute, or chronic inflammation of the lungs. Of the third group, in which there was a more intense exposure—four hours a day for 8 months—90 per cent. of the guinea-pigs died after exposures ranging from 2 to 7 months. At a variable time after exposure, the animals began to show a gradual loss of weight, an increased leucocytosis in which polymorphs predominated, increased non-protein nitrogen of the blood, and a decreased CO_2-combining power of the blood plasma. Tissue changes seen at autopsy consisted of inflammatory reactions in the upper and lower respiratory tracts, and fatty changes in the livers. Albino rats, under the same conditions of exposure, died in 1–16 weeks with inflammatory lesions in the lungs.

THE PROBLEM

Students of preventive medicine may draw at least one important conclusion from the findings described in these four papers—namely, that in places where carbon-arc electrodes are being consumed there must be enough ventilation, either mechanical or natural, to remove the excess heat and particularly the nitrous fumes that are generated by the arc. We know of no general survey—comparable with one carried out recently in Nebraska—to ascertain the conditions under which cinema operators work in this country. In the Nebraska inquiry it was found that there were poor ventilation and unhealthy conditions in most of the cinema projection booths, and as a result of it regulations were drawn up recommending efficient standards of ventilation in such places. Drinker and Snell [3] examined the existing State codes, ordinances, and fire regulations covering the construction and operation of other motion-picture booths in the United States, and found much variation in the requirements of the different States. In very few States were the suggested rates of ventilation adequate to remove both the heat and the fumes.

The problem of the removal of nitrous fumes from the atmosphere also arises in light-treatment rooms. Dadlez [1] found in one room with a capacity of 1760 cubic feet concentrations of NO_2 as high as 80 p.p.m. near the lamp after it had been burning for 30 minutes. In a smaller room the NO_2 concentrations were 91–117 p.p.m. He suggested that the arc lamp in medical treatment should be used only when there is efficient through ventilation in the room. In cinema studios too, where arc lamps without flues are used in the making of motion pictures, attention should be paid to the efficiency of the ventilation.

The introduction and the rapid increase of the amount of welding of various forms done in such places as metal-works and shipyards has also drawn attention to the acute pulmonary conditions which occur in welders, and which are ascribed in many cases to the nitrous fumes formed by the electric arc. Bridge [7] recorded in 1934 a number of cases of acute poisoning in oxy-acetylene welders who were working in a confined space in a ship, and Titus, Warren, and Drinker [8] showed that the nitrous fumes from an electric welding apparatus set up pulmonary œdema in animals. More recently Doig and McLaughlin [9] described radiographic changes in the chests of men who had been welding for a number of years. They were unable from lack of pathological material to state the exact cause of the shadows shown in the X ray films, but suggested that the inhalation of small quantities of nitrous fumes, together with fine iron-oxide dust, might set up small areas of chronic inflammatory change, congestion, or fibrosis of the lungs. Be this as it may, the formation of nitrous fumes by the electric arc clearly makes it desirable that welding, especially in enclosed spaces, should be done only when the ventilation, either mechanical or natural, suffices to remove the fumes.

[7] Bridge, J. C., Ann. Rep. Chief Inspector of Factories, Home Office, 1934, p. 68.
[8] Titus, A. C., Warren, H., and Drinker, P., *J. industr. Hyg.* 1935, 17, 121.
[9] Doig, A. T., and McLaughlin, A. I. G., *Lancet*, 1936, 1, 771.

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MEYERSTEIN INSTITUTE OF RADIOTHERAPY

THROUGH the generosity of Sir Edward Meyerstein the Middlesex Hospital has acquired a compact and self-contained unit in which all forms of radiotherapy are available for both hospital and private patients. This reconstructed building, the Meyerstein Institute of Radiotherapy, which was formally opened on June 9th by Sir William Bragg, is on the west side of the hospital's island site, with its entrance facing Nassau-street. It has four floors devoted to radium and X ray treatment, with six single rooms for private patients under the care of the hospital staff, and communicates with four wards in the main hospital containing 64 beds for the institute's patients.

The northern half of the building, part of the old cancer wing, has been divided into treatment cubicles, with walls and floors protected with lead to prevent stray irradiation into the corridors and rooms below, and microphones and loud-speakers for communication between patient and radiographer.

On the ground floor of the institute is the entrance hall (Fig. 1), the administrative office in which patients' records are kept, waiting-rooms for private and hospital patients, a corridor leading to the main hospital, and three treatment cubicles. The first cubicle contains a Phillips air-cooled 100 kv. plant for skin therapy with a lateral control panel and observation window. In the second is a 200 kv. water-cooled Phillips tube with a constant potential Greinacher generator and a spare 100 kv. tube for emergencies. The third cubicle is the teleradium room (Fig. 2) where mass irradiation at 8 cm. distance is carried out with 4 grammes of radium. The radium when not in use is housed in a safe surrounded by 10 in. of lead and is transferred to and from the applicator head by pneumatic power provided by an Electrolux vacuum cleaner. The patient undergoing treatment is seated in a dental chair which has a special head-rest and is mounted on a calibrated turn-table so that a satisfactory treatment position may easily be repeated at a subsequent sitting.

The first floor is for women patients. A corridor leads directly to the two female wards associated with the department and opening from it are three private patients' rooms, a room for clinical examinations, and an office for the medical officer. There are four treatment cubicles on this floor, served by two constant potential Greinacher generator plants with 200 kv. oil-cooled Siemens tubes. These tubes are controlled from a panel provided with buttons and lighting indicators, so arranged that the apparatus as a whole must always be switched on in the same order; for instance, no current can be conducted through a tube unless the appropriate cooling pumps are working. Once the required tension has been obtained on the Siemens tubes the apparatus is left running for the rest of the day's treatments, the rays being shut off between applications by a lead shutter controlled from the desk panel.

The second floor is a replica of the first but has Metropolitan Vickers tubes. In these the usual sealed glass vessel has been abandoned and the tubes are of steel, the vacuum being maintained by constant evacua-

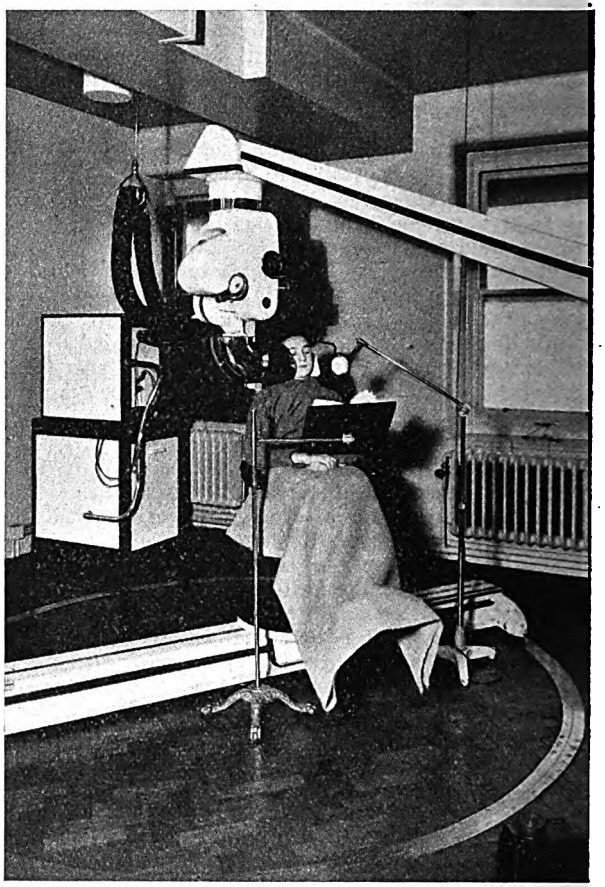

Fig. 2.—The Teleradium Room.

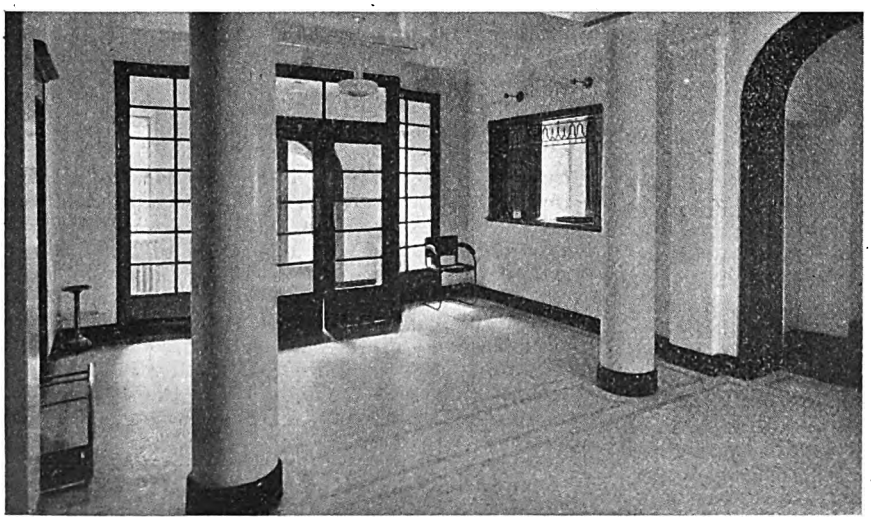

Fig. 1.—The Entrance Hall.

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tion by means of pumps. This type of tube can be dismantled completely and a broken filament or cracked target replaced at a fraction of the cost of replacing a glass tube.

The third floor contains the surface radium department with its own examination-rooms, four comfortable waiting-rooms where out-patients may rest with their application in position, mould-room, and mounting-room.

The institute is staffed by an honorary director, Dr. J. H. Douglas Webster, five whole-time medical officers and a resident house officer, a sister and six radiographers, and can also draw on the full resources of the staff, special departments, and laboratories of the main hospital.

In declaring the institute open Sir William Bragg referred to the outstanding work on radiotherapy done at the Middlesex Hospital and to the munificence of Sir Edward Meyerstein. In the application to medicine of our knowledge of radio-activity, so much of which we owed to the work of Lord Rutherford, the gap to be crossed between science and practice was of extraordinary width; the cure of malignant growths is so far removed from the pure science of atomic action. But the need for a cure is so urgent that however empirical the treatment, it must be tried. On the other hand, if any understanding can be gained of the biological processes which go wrong, and of the action of radiation processes upon them, the chances of success are greater. So both sides of the question have to be carefully considered; and it takes a good staff and good opportunities to make headway. We have to exercise our judgment as to the extent of money and trouble we spend on the two sides relatively. It is not realised how tremendous is the influence of increasing knowledge of Nature —i.e., science true, so called—on all human activities, how this is growing, and how utterly necessary it is to realise and understand it. If one looks round, it is obvious enough: but it is not generally seen to be a growing force, irresistible, which must be watched and studied. The application of radiation to pathological work is only one example; it happens to be rather extreme and special, that is all. Understanding of this force, and care in its guidance, are great necessities of the day.

THE SITUATION IN CHINA

THE public health services of China, which scarcely existed previously, developed rapidly from 1928 onwards, thanks to the technical assistance given by the League of Nations. More than 500 public health institutions had been set up and some 2000 technicians had been trained at the time of the Japanese invasion. Unfortunately most of this organisation was situated in or near the large towns on the coast and the outbreak of hostilities dislocated all this effort. The National Health Ministry and the Central Field Health Station at Nanking were wrecked by air-bombing at the beginning of the war, and many other hospitals and public health institutions have since suffered. At the same time vast migrations of the populace took place—masses of refugees moving west and south while millions of troops were moving east and north. In September, 1937, the Chinese Government drew the attention of the Council of the League to this situation and to the resultant danger of widespread epidemics. The Assembly voted two million Swiss francs (£90,000) to be spent in coöperation with the Chinese Government in carrying out an anti-epidemic campaign. A special subcommittee of the Health Committee framed a plan of action under which three anti-epidemic units would be sent to China as soon as possible to advise and support the Chinese technical services, which would themselves assume responsibility for the anti-epidemic work.

Each unit was to consist of an epidemic commissioner (leader of the unit), a specialist medical officer in epidemiology and bacteriology, a sanitary officer, a medical organiser of area units, and an assistant and mechanic to be locally recruited. The material to be provided consisted of a mobile laboratory, a delousing station, transport, and a stock of drugs, sera, and emergency supplies. The three medical units—the first under Dr. H. Mooser (Swiss), the second under Dr. R. C. Robertson (British), and the third under Inspector-General A. Lasnet (French)—arrived in Hong-Kong early in January and immediately got in touch with a representative of the Chinese Government and with Dr. B. Borcic, who is the League of Nations' technical adviser to the Chinese on public health questions. Early in February all three units had reached their designated stations, after arduous and adventurous journeys. The first, or German-speaking, unit is stationed in the north at Sian-Fu, the capital of Shensi; the second, or English-speaking, unit has its headquarters at Changsha, the capital of Hunan; and the third, or French-speaking, unit has stations both at Nanning, the capital of Kwangsi, and at Canton.

In connexion with each unit the Chinese Government have organised their own anti-epidemic units each consisting of from 150 to 250 doctors, nurses, sanitary engineers, sanitary inspectors, and others, to deal with epidemic problems in the Northern, Central, and Southern areas of the country respectively, and the Chinese Government have also voted 160,000 dollars to the League of Nations' epidemic commission for its preventive activities.

The task of each unit after arrival in its area has been first to establish contact with the local health administration, and secondly to survey not only local epidemic conditions but also the existing machinery for controlling them. While this is being done, anti-small-pox and anti-cholera vaccination is being carried out and preparations made for the production of typhus vaccine and calf lymph locally.

THE ENGLISH-SPEAKING UNIT

The work of the second unit is naturally of particular interest to British readers. This unit is responsible for anti-epidemic work in the Central Provinces of Hupeh, Hunan, Kiangsi, and also to some extent in South Anhwei, Chekiang, and Fukien. Communications are difficult and reports speak of the arrival of twenty lorries from the coast in a snowstorm "sliding about on the edges of precipices, wings being bashed in right and left, cars running backwards down 6 ft. banks" and so on.

The first step was to undertake an epidemic survey in these provinces and to establish a system for reporting cases of cholera, typhoid and paratyphoid, small-pox, epidemic meningitis, diphtheria, plague, and typhus. This reporting system is working well in Kiangsi and is being improved in Hunan and Hupeh. There have been small outbreaks of small-pox and sporadic cases of cholera, with an increasing number of cases of meningitis and diphtheria. More serious trouble is expected as summer approaches and the condition of the numerous refugees becomes

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worse. A big campaign of inoculation against cholera and of anti-smallpox vaccination has been undertaken by the unit in conjunction with the local health authorities and the Chinese Red Cross.

Dr. Robertson's report emphasises the fact that refugee populations accept preventive services such as inoculation and vaccination much more readily if it is combined with the general work of a clinic which at the same time looks after minor ailments. He adds that "a supply of ointments for skin diseases, the treatment of eye complaints, the distribution of a few comforts and of foodstuffs to supplement an inferior diet make all the difference between success and failure in measures for anti-epidemic prevention." Control of the diet of refugee camps may also be used to reduce the risk of the spread of certain infectious diseases, particularly intestinal diseases. Dr. Robertson asks that efforts should be made to send supplies of cod-liver oil and substances containing vitamin B_1 to combat beri-beri among the refugees, and supplies of clothing are needed for use by the refugee population while their own clothing is being disinfested.

On April 29th the isolation hospital set up by the Hankow section of the second unit was wrecked and two of its staff killed in a Japanese air raid.

WORK OF HOSPITALS

Substantial appropriations for the health services have been made by the provincial governments as well as by the central government and indeed the apparent disaster which has overtaken the health services of China seems to have stimulated the Chinese to even greater efforts. That the need is still urgent may be judged by the following eye-witness's description of a general hospital in Northern China :—

"It is lodged in a series of very primitive and poorly built huts with loamy soil and mud-and-stone walls. The roofs are partly leaking. The windows being arranged only on one side are small and covered by white paper sheets. The interior of the houses is very dark and gives the impression of caves rather than chambers. The Kiangs (raised stone or mud platforms) are heatable and covered here and there with coarse straw. The patients are lying close together. I saw in one small and dark room nine patients suffering from tuberculosis. One of them showed symptoms of tubercular-meningitis in an advanced stage. All that had been done to separate this severely ill patient from the others was that he had been turned round and lay with his head at the feet of the other patients. Some of them are wounded, many of them are suffering from tuberculosis.

"This hospital is in urgent need of practically every kind of material. There are only a few available spittoons. This is the reason why most of the patients, among them also those with active tuberculosis, spit on the floor. The severely sick are obliged to spit into paper. Bedclothes are missing entirely and the patients depend exclusively upon their own clothes which are torn and in a bad state in many cases. Only some of the patients have blankets with them."

Our correspondence columns this week contain an appeal for drugs, surgical instruments, clothes, and money to relieve and make it possible to continue the work of such institutions. The Lord Mayor's Fund for the Relief of Distress in China is trying to cope with three problems—destitution among British residents in China, the care of refugees, and the care of wounded (both civilian and military) in hospitals. In the Central China area alone 26 British hospitals have been helped to keep going. Dr. H. G. Thompson writes of the fine work being done by our medical colleagues under great difficulties. "Surely," he adds, "the least that we who live in comfort and safety at home can do is to keep them supplied with the necessary medical stores, anæsthetics, antiseptics, dressings, drugs, and instruments without which they cannot carry on."

CONTROL OF VENEREAL DISEASES IN SCANDINAVIA AND HOLLAND

FOR some years past the public health authorities of many countries have noted with interest the remarkable decline of syphilis in certain Scandinavian countries. In 1935 a commission appointed by the mayor of New York City, and representative of New York City and State, studied the method of control used in Scandinavia and in this country, and in their report [1] it was suggested that measures for the control of syphilis had been less successful here, and that this might possibly be because we have no legislation to enforce treatment on recalcitrant patients. It was shown later [2] that this impression was partly based upon figures which had been misinterpreted, but it raised again the difference of opinion between those who consider our present voluntary system adequate and those who advocate notification and compulsory treatment of venereal diseases.

NOTIFICATION AND COMPULSION ABROAD

A year ago the Ministry of Health appointed Colonel L. W. Harrison, Mr. D. C. L. Ward, Dr. T. Ferguson, and Mrs. Margaret Rorke to make a first-hand study of antivenereal measures in three Scandinavian countries where venereal diseases are notifiable and treatment can be enforced, and in Holland where there is no notification and measures for control depend entirely on voluntary coöperation. The report [3] of this delegation is now available and describes the existing situation, the methods of control, and the incidence of venereal infections in Denmark, Sweden, Norway, and Holland. The geographical and social factors are similar in the three Scandinavian countries, but compared with Great Britain the population is more rural and its density far less—a factor of importance in relation to the spread of venereal diseases. On the other hand all these countries have many ports that are visited by vessels from abroad and many Scandinavians go to sea and are thus apt to contract venereal infection abroad. The people of these countries are of a high standard of education and intelligence, and appreciate the importance of coöperation in public health measures. Medical practitioners are well trained and command the respect and obedience of their patients. The public health services are controlled from a central organisation. Holland is more like our own country in that it is almost as densely populated as England and Wales and, from the standpoint of antivenereal measures, the heavy traffic with other countries by sea and river is an additional disadvantage. In other respects the social conditions are like those in Scandinavia.

The measures adopted against venereal disease are really very similar in the three Scandinavian countries. In Denmark and Sweden free treatment

[1] *Amer. J. Syph.* 1936, Part 2.
[2] *Lancet*, 1937, 1, 425.
[3] Report on Anti-Venereal Measures in Certain Scandinavian Countries and Holland. By L. W. Harrison, M.B., F.R.C.P.E., Dudley C. L. Ward, M.A., T. Ferguson, M.D., F.R.C.P.E., and Margaret Rorke, M.B., M.C.O.G. London. 1938. H.M. Stationery Office. Pp. 156. 2s. 6d.

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is available for all, regardless of financial status. In Norway treatment is free only to indigent persons, but for those in employment is obtainable through the machinery of the compulsory health insurance scheme under which the greater part of the cost is defrayed. In all three countries treatment or isolation may be enforced if the patient discontinues treatment before cure, and severe penalties may be imposed on the patient who knowingly exposes others to the risk of infection. The duties of the medical practitioners in charge of such cases are clearly defined and include notification to the appropriate health officer; but names of patients are withheld unless they default. In Sweden the law provides for compulsory notification, examination, and treatment of persons named as sources of infection. In Denmark such notification is not obligatory and compulsion cannot be exercised. In Norway sources of infection may be notified, but in practice this is seldom done except in the case of prostitutes. The members of the delegation formed the opinion that in Sweden the numbers notified are truly representative of the incidence; that in Denmark the reporting of cases of syphilis is incomplete, owing to misunderstanding by practitioners of the type of information required; and that in Norway notification is far from complete. They were satisfied that in those three countries the regulations are not regarded with antagonism by the public and do not lead to concealment of disease or encourage resort to unqualified persons for treatment. Owing to the intelligent coöperative spirit of the people, who are free from false shame in sexual matters, and the uniform standard of medical education and health services, these countries are ideal for the smooth working of a statutory scheme of venereal disease control. In Holland treatment is neither free for all nor compulsory; and there is no system of notification. In the majority of clinics attempts are made to secure continuity of treatment and to trace sources of infection by means of women social workers especially trained under a system inaugurated thirteen years ago by the Dutch Society for Combating Venereal Diseases.

DECLINE OF SYPHILIS

It is well known that in Denmark and Sweden syphilis has declined progressively of late years. In the present report it is estimated that the number of new infections each year in Denmark is approximately 600—or 1·6 per 10,000 of the population. In Sweden the incidence of early acquired syphilis in 1935 was estimated at 0·67 per 10,000—a figure based on the evidence of reported cases. In Norway the figure for 1935, founded on evidence from notification which is admittedly incomplete, was 1·4 per 10,000. In Holland the only available evidence of incidence is the result of a questionnaire submitted to the dermatologists of Holland in 1935 and answered by 85 per cent. of them in respect of their private patients and by all the directors of clinics and dispensaries dealing with venereal diseases. This gave an estimated incidence of early syphilis in Holland in 1935 of 1·06 per 10,000. These figures are compared with an estimated incidence of 1·7 for early acquired syphilis in England and Wales in 1936, and 1·8 in Scotland judged by patients treated at the clinics in the same year.

As regards congenital syphilis, the infants under one year of age dealt with at the treatment centres in England and Wales in 1935 amounted to 0·42 per 1000 live births and in Scotland to 1·63 per 1000. These figures are compared with 0·33 for Denmark and 0·12 for Sweden for the period 1930 to 1934. The deaths from syphilis of infants under one year of age per 1000 live births in 1935 were Denmark 0·18, Sweden 0·10, England and Wales 0·29, and Scotland 0·27. It is suggested in the report that the better results obtained in Denmark and Sweden are due to the more frequent use of serum tests during pregnancy.

Adequate comparison of the incidence of gonorrhœa in these countries is not possible because the figures obtainable from Holland and from this country cannot be regarded as fully representative; but it seems clear that although the incidence in Denmark and Sweden has declined none of these countries has made outstanding progress in control of this disease.

The compilers of the report conclude that the degree of success against syphilis and of failure against gonorrhœa have been broadly similar in the countries that employ legislation to enforce treatment and in those that rely on a voluntary system. They believe therefore that compulsion is not a major factor in the success of antivenereal measures in the countries where it is employed.

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

OBSTETRICS IN DUNDEE

I HAVE previously referred to the proposal by the court of the University of St. Andrews to give the new professor of obstetrics, when he is appointed, wards in the municipal hospital at Maryfield instead of in Dundee Royal Infirmary. This proposal has aroused considerable discussion, and last week it was rejected by the Dundee town council by 23 votes to 9. Those who opposed the scheme declared that there has been a rift between the university court and the directors of Dundee Royal Infirmary with regard to the appointment, and that the proposal to coöperate with the municipal hospital departed from an old-standing agreement with the infirmary. It was also stated that the proposal would mean the closing down of Dundee Royal Infirmary school of maternity training.

This problem is an instructive example of the difference of opinion which may arise between university authorities and the voluntary teaching hospitals. Whatever may be the exact reason for the disagreement in the present case, it is gratifying to note that the municipal authorities in Dundee realise the importance of maintaining the status of the local voluntary hospitals.

ZINC PROTAMINE INSULIN

At a meeting of the Medico-Chirurgical Society of Edinburgh last week Prof. D. M. Dunlop spoke on zinc protamine insulin. He pointed out that the modern soluble insulin is so readily absorbed that its action lasts only 4–5 hours. This necessitates frequent doses in certain forms of diabetes. The action of zinc protamine insulin, however, is much more prolonged and may last for nearly 26 hours; an injection given on one morning will still have an effect on the blood-sugar level at breakfast time on the following day. This makes it possible to reduce the hyperglycæmia which tends to occur, especially during the night, in severe cases; the number of injections required is also much reduced. Prof. Dunlop said that during the past year he had converted 150 out-patient diabetics to zinc protamine insulin. It was unnecessary to admit the patient

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to hospital for the change, and 45 per cent. of his cases had no return of glycosuria during the process. The average dose of zinc protamine insulin required was slightly lower than that of soluble insulin. When the total daily dose of soluble insulin is 25 units or less the patient could be put at once on the same dose of zinc protamine insulin. When the total was greater than 25 units it was better to give three-quarters of the dose in the form of zinc protamine insulin and one-quarter in the form of soluble insulin. Of 102 carefully studied cases 77 did not require any soluble insulin after the change in the drug; 25 required a little soluble insulin to control the hyperglycæmia following breakfast and to avoid the hypoglycæmia which tends to occur in the afternoon or evening when large doses of zinc protamine insulin have to be given. For a new case, with moderate diabetes, 10 units of the zinc protamine preparation could be started without hesitation but any increase of the dosage should be made more slowly than with soluble insulin, about 4 days being allowed to elapse between each increase. Severe cases were better dealt with by soluble insulin at first and later the change could be made. In Prof. Dunlop's experience the average diabetic feels better on zinc protamine insulin and he attributes this to the avoidance of hyperglycæmia. With this treatment the carbohydrate given should be spread equally over the principal meals. When hypoglycæmia occurs the reactions may be severe; they are more difficult to relieve and are different in manifestation from those which occur with soluble insulin. Instead of the usual sweating, palpitation, and tremor observed, the symptoms of hypoglycæmia with the zinc preparation are slight headache, general malaise and, sometimes, nausea and vomiting. Patients must be warned, therefore, that the symptoms of too much insulin will be different with the new preparation, or else they may pass into coma without realising the cause of their ill-being.

Prof. Dunlop left no doubt of his conviction that the use of zinc protamine insulin constitutes an important advance in the treatment of diabetes mellitus.

IRELAND

(FROM OUR OWN CORRESPONDENT)

THE IRISH FREE STATE MEDICAL UNION

THE annual general meeting of the Irish Free State Medical Union was held in the Royal College of Surgeons on May 2nd. In the morning a scientific session was held when a spirited discussion on the diagnosis and treatment of gastric disease was introduced by Dr. J B. Magennis and Mr. Seton Pringle. At the business session in the afternoon Dr. Conor Maguire, the president, and subsequently Dr. P. MacCarvill, the newly elected president, took the chair. The membership of the Union now stands at 955; 109 new members were elected during the year, 12 resigned, and 10 died. There were 23 transfers to the British Medical Association and 20 transfers from that body to the Union, consequent on changes of residence. The audited accounts showed a total income from all sources of £2635, and a total expenditure of £2150, leaving a balance of income over expenditure of £485, and a balance of assets over liabilities of £2886.

In the discussion which followed an account of the various activities of the council during the year, the cumbrous form of the constitution of the Union was criticised, and a small committee was appointed to devise, if possible, a simpler constitution. Discontent was expressed with the reluctance of several of the Ministers to discuss with representatives of the Union various matters concerning the welfare of the profession. There has been, as yet, no settlement of the differences between the Union and the Department of Local Government and Public Health on the question of a suitable fee for immunisation against diphtheria. At the annual general meeting last year a resolution had been passed which had tied the hands of the council, and it was decided to rescind part of that resolution so as to leave them more free to enter into negotiations. The fee so far approved by the council is about half that approved in Northern Ireland and less than half that paid at present in Great Britain. It is hoped that the difficulty may be solved by a general increase in the salaries of the district medical officers of health rather than by laying down a fee for each act of immunisation. The meeting ended with a dinner, attended by some 60 members and their friends at the Dolphin Hotel.

ADMINISTRATION OF THE MILK AND DAIRIES ACT

When the Milk and Dairies Act (1935) was under discussion in the Dáil three years ago it was recognised that very few of the local authorities entrusted with the administration of the Act are much interested in health affairs, and that however good the legislation may be it cannot be useful unless rigorously administered. Unfortunately there is evidence that these forebodings were justified and that in many—probably most—rural areas careful administration has been lacking. Moreover, in some of the few cases where prosecutions have been brought by the rural authorities the courts have shown a deplorable lenity. It is unjust to the milk-producers who have taken pains to obey the law and to produce clean milk to find that their competitors are permitted to sell dirty milk and even if convicted of the offence are only punished by the imposition of trivial fines. In his annual report on the health of his district Dr. D. F. McCarthy, medical officer of health for the North Riding of County Tipperary, remarks that if the Milk and Dairies Act were administered in a thorough and efficient manner it could do much good for the health of the nation, but the half-hearted operation of such an important piece of legislation might well leave the position worse than before the Act became law, and the public under a false sense of security.

THE LANCET 100 YEARS AGO

June 9th, 1838, *p.* 374.

From a leading article on the Irish Medical Charities Bill.

. . . ADAM SMITH proved, a long time ago, that Governments invariably do everything which they undertake worse than private individuals: and it is a remarkable fact that places under Government are the only places for which all kinds and classes of unqualified persons apply. A Fiddler would put in for an Inspectorship of Prisons under Government, a Poet for a post in the Finance department, a briefless Barrister for the Chancellorship, a shallow Lord for a Colonelcy in the Guards, a Novelist for a Colonial Governorship; one of the 26 County Surgeons, the greatest ass in all Ireland, for a place under the Medical Charities Bill: and it is evident that every one must have some chance, or why would so many put into the Official Lottery.

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PANEL AND CONTRACT PRACTICE

Incapacity in Scotland

THE annual report of the Scottish Health Department usually has something to say about chronic incapacity which will interest insurance practitioners. To keep the inquiry within reasonable limits it was decided to confine it to cases which had recently begun but which seemed likely to become "chronic," actually those completing thirteen weeks of incapacity on or after Sept. 1st, 1937. Besides serving the main object of research into the general problem, a review of every case at the end of a quarter might, it was felt, be of value to the individual concerned. In some it should be possible for the Department's regional medical service, by means of a second examination of the patient (in which special diagnostic measures or the services of a specialist might be utilised) to render assistance to the doctor concerned. Such assistance should be more profitable at a comparatively early stage of the incapacity. It might throw light on the extent (if any) to which prolongation of incapacity is attributable to lack of facilities for specialist diagnosis or treatment. Up to the end of 1937 the regional medical service had disposed of 3444 cases, of which 776 had been examined.

In what is called in the report "chronic incapacity"—cases in which incapacity began before the commencement of a statistical year and continued throughout the year—an analysis of the morbidity reports goes to show that the number is greater than has been generally realised, and that they account for a substantial portion of the annual burden of claims for sickness and disablement benefits. Their number has been increasing from year to year, though latterly at a less rapid rate, while in more than 50 per cent. of them incapacity has begun at age 45 or under. In the year to June 30th, 1937, 30,754 such cases accounted for 11,225,210 days of incapacity, or about 40 per cent. of the total for the year. This means that one insured person in every 60 was unfit for work throughout the entire twelve months. Nervous diseases (mostly insanity) are the most common cause of chronic incapacity, followed in order by (2) rheumatic, muscular, and joint conditions, (3) diseases of the circulatory system, (4) tuberculosis, and (5) bronchitis. Together these five cause-groups account for two-thirds of the chronic cases.

GRAINS AND SCRUPLES

Under this heading appear week by week the unfettered thoughts of doctors in various occupations. Each contributor is responsible for the section for a month; his name can be seen later in the half-yearly index

FROM A LONDON PRACTITIONER

II

THERE is a certain type of mind—the sort which loves the ordered industry of the hive, which yearns for more tidiness in human affairs and generally leans towards State socialism—which is shocked by what it sees as needless chaos in our practice. Why is there no team-work, no coördination among us, why is treatment not systematised, how can it be right that half a dozen methods of treating a fractured femur or a duodenal ulcer should coexist? People with this type of mind long for an orderly, homogeneous, coördinated, and directed medical service, and believe that our patients would benefit enormously were it established.

This criticism seems to me to have little weight. It breaks on the hard facts of the natural history of diseases and of human nature. The art and even the science of medicine obstinately refuse to be pigeonholed. Text-books, which of necessity attempt the feat, notoriously fail to attain anything like complete correspondence with the phenomena of clinical experience. "The books will tell you," says the experienced clinician to his students, "but . . ." or "of course you will not find this in the books." But it is not the books' fault. The trouble is that they are attempting to reduce to order the infinitely variable reactions of individuals to noxious things. Of course they fail, and when it comes to treatment matters are still worse. "Treat the patient, not the disease" is not a teacher's maxim, it is a plain necessity, for diseases have no independent existence. We can do no other; and since patients and their circumstances vary infinitely, the unhappy authors must choose between vague generalities—"the exhibition of mercury is indicated"—or a detailed programme which may prove utterly inapplicable in the circumstances of a given case.

Medicine is, and so far as I can see must always be, an extremely individual matter. Its problems are presented by individual patients and must be decided, for the most part, by single, independent, responsible medical men. There is much talk of "team-work," but it is very loose talk. There is a place for it, of course. Most operations require a team in the sense of two or three people who know something of each other working together, and there are times when a diagnostic team is useful or even essential, but generally a team is the very last thing the patient needs. As well might a battalion go into action under a team of colonels or a sinner confess to a team of priests, as a patient put himself in the hands of a team of medical men. If the thing were called a committee—which is nearer the truth—it would be shorn of some of its false prestige.

* * *

Our practice is much criticised for being concerned with treatment instead of prevention. "You are," say they, "at best a mere botcher and patcher. You watch people get well, or watch them dwindle and die. You give them medicines in which you do not believe. You do not get down to the root of the matter; you do not treat causes. You deal in sickness, not in health. Why not emulate the Chinese physician, who takes fees from his patients only while they are well, and keeps them in health for fear of losing his money?" (This probably mythical Chinese doctor has a great vogue among the intelligentsia.) "You need to reorientate yourselves altogether, acquire the Preventive Outlook, see your patients in health, instruct them in hygiene, examine them every six months, exhort them to seek you early and Nip their Diseases in the Bud."

Do I exaggerate? Let me quote. "During the last sixty years there has been a revolution in our attitude towards disease. The main reason for this is the idea that the cause of a disease is the most important thing about it. This idea has already been

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very useful *and it is probable that, by means of it, the present generation will be able to prevent or cure all the ordinary diseases*" (N. W. Pirie: An Outline for Boys and Girls, p. 228). (Italics are mine.)

This from the pen of a young biochemist fairly deprives me of breath, but it is perfectly typical of the book in which it occurs and reflects, accurately enough, the outlook of the great band of science-worshippers. To optimists of this order we must indeed appear but as purblind tinkers groping in medieval darkness. But what weight is there in the argument?

* * *

First for the negative or destructive part. "We do no real good." Is it not a very great service to any patient to give him a diagnosis? It is, beyond question, what, as a rule, he most wants of us, and the notion, still fostered in hospitals, that it does not interest him is palpably false. If, in addition, we can tell him the probable course of his malady and what he should do to put himself in the way of recovery, we have done him a further service; if we can allay his discomforts we have again increased his debt to us—and there are few conditions we can do nothing to alleviate. Even if, as sometimes happens, our medicine is no more than a symbol of sympathy, a sign of belief in the reality of our patient's trouble and our desire to help him, it must be forgiven us in this soft-hearted South Country (for, it seems, in Scotland they can dispense with the token-bottle). But not seldom we can actually deflect the course of the disease. Have we no iron, liver, thyroid, or insulin; no Prontosil, salvarsans, digitalis, or quinine; no effective ointments, diets, or physical treatments? Is it nothing—putting aside the life saved by prompt diagnosis and apposite surgery—to discover and deal with a chronic infective focus? Is it nothing to evaluate a patient's symptoms for him so that he may see them in proportion and perhaps accept them as arising from emotional conflicts even if we cannot fully analyse them or reorder his life for him? Is it nothing to see him through an illness, whether to death or recovery? Is it nothing, even, to listen patiently to the tedious reiterated recital of the symptoms of the obsessed and to make the appropriate comforting reply, well knowing that it must all be done again next week? Is it nothing to extract the buried thorn from the finger, the bead from the child's nose, the bit of grit from the conjunctival sac?—to stand, invisibly if possible, between our patient and the charlatan, to adjudicate on the advice of friends, to interpret the dark speeches of consultants? Nothing to preside over the dangers of birth and over the pains of death? This is not half the list of the daily duties of the tradesman in health, the botcher and patcher busy with results, but I think it is an honourable list—a full man's job, and I cannot for my life understand who will do all this for our patient if the tinker is called to Higher Forms of Service.

* * *

But now for the Preventive Spirit and instruction in health, "Ask your doctor and ask him early" and Nipping it in the Bud.

Let certain quite large things be granted.

We have thought in the past too little of ætiology. I was never encouraged as a student to try and piece together the complex of causes which brought X to the operating table with a perforated ulcer, laid Y on his bed with pneumonia, or poor little Z on the post-mortem room slab with generalised tuberculosis. If I could trace the pathology a little way back that was good enough; the causes—the human causes—especially the preventable causes were not my concern. No text-book of medicine, so far as I know, opens with a chapter of prolegomena on the respective influence of constitution, environment, diet, personal hygiene, and exposure to infection in the production of disease-pictures, nor are diseases classified according to their broader and remoter ætiology. How much could be done to keep men in health, without help from the environmental trappings of civilisation on which we lay such stress, if only their diet and way of life could be controlled and they could be kept away from the towns, was made plain in the war for all who had eyes to see; and it is sad to reflect how carefully the lesson has been forgotten by a community which finds both the circumstances of that great experiment and its implications disturbing to its peace of mind. Every well-spent holiday proves the same thing.

* * *

Let me admit that as doctors we should love health and hate disease and should wish to see and to keep our patients well. Of course! But we do, and of the few that do not there is little to be said. The man who likes to make chronic invalids and treat them indefinitely has his reward—grateful patients and plenty of guineas (it needed no Prophet from our ranks to tell us that), but he is outside the argument. Could we—the many with unwrung withers, honestly glad to see our patients well—could we prevent and forestall disease by a new relation to our patients and a new outlook?

The recent triumphs of medicine, it is said, have been preventive.

True in a sense. Cholera has been prevented (water-supply) and typhoid (so long as the authorities keep their eyes skinned) and chlorosis is gone (? change in ladies' fashions and general liberation of women circa 1912) and summer diarrhœa of infants (? the welfare centre,? the motor-car replacing the horse,? the more equal distribution of wealth,? all these plus x) and rickets (a real one, for once, direct result of research and teaching), and before all this small-pox was dethroned by vaccination and now it has grown very mild, and scarlet fever and many other things much milder and no one knows why.

The increased expectation of life, the fallen infant death-rate, the disappearance of this and that disease are impressive enough in their way, but how great a part could the general practitioner have played in the piece however enlightened?

* * *

There still remains, beyond question, a mass of disease and ill health theoretically preventable. Ill health due to unremitting toil and to having nothing to do, to overeating and overdrinking and to being underfed, to being exposed to all weathers and to never seeing the sun, to being herded together in tubes and offices, to wearing fashionable shoes, to having too much money or too little, to living in slums or in superheated flats, to the burden of relentless responsibility and to unemployment of the mind; there are the industrial diseases and the huge total of road injuries—all the unnumbered bodily troubles due at bottom to ill distribution of wealth and of work, and to human follies and foibles, to the pursuit of pleasure, money, speed, and comfort. There is also much ill health which the dentist could and would prevent if only he were given the chance.

But where does the doctor come in?

In the important matters of hygiene—the matters in which doctors could speak with certainty and with

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one voice—the ordinary citizen knows already what is good and what bad for his health. He knows all about sunshine, fresh air, exercise, cleanliness, "requies, moderata dieta" and the rest. His rulers know it even better. Sometimes it is hard, sometimes impossible for citizen or ruler to do or bring about the right thing. Sometimes it would be easy, given the will, sometimes quite possible, but at a price in cash, in effort, in overcoming prejudice or vested interests, in interfering with the sacred duty of making money ("Business") which they are not prepared to pay.

It is not for lack of knowledge that the nations beat their ploughshares into swords, nor because they have no smith able to make a pruning-hook out of a spear, and it is not for lack of knowledge or technical skill that a vast amount of good health goes unattained and unpurchased by the citizen and by the State; it is for lack of a sense of values. Even when specific means for preventing some of the worst of diseases are available—immunisation for diphtheria, prophylaxis after exposure for syphilis—they are not welcomed by the body of citizens. In both cases the supposed price appears to many minds too great to pay.

Mr. Kurt Hahn, of Gordonstoun School, wrote recently: "Our civilisation is diseased. It does not transmit incentives towards health-giving habits of life."

In the face of all this, is there not something a little dishonest in the suggestion that we should not confine ourselves to giving advice when asked, but should preach the gospel of prevention to a body of citizens supposed to be yearning after it in ignorance?

CORRESPONDENCE

RELIEF OF DISTRESS IN CHINA

To the Editor of THE LANCET

SIR,—The news which has been coming through from the war areas in China cannot give an adequate picture of the terrible sufferings of the people and the need for help at the present time.

Large areas have been rendered desert by complete destruction of farms and villages. Enormous numbers of the population have been on the move; some seeking for safety and others in search of food. In a great many places the chance of a harvest either this year or next has gone, for farms are burnt, while beasts for ploughing, implements, and seed have all been destroyed. A death-rate in a refugee camp for the first few months was 380 per 1000, to a large extent among the children, and this gives but a bare statistical picture of an incalculable amount of suffering and anguish, both physical and mental. With summer coming on, epidemic diseases such as cholera, relapsing fever, the dysenteries, and smallpox are spreading, whilst food-deficiency diseases such as beri-beri are becoming rampant.

British hospitals, established by missions of all denominations, have been nobly endeavouring to do their part in meeting the need, and without a word of complaint they are being overwhelmed with the care of the sick and wounded. Since the early days of the struggle the Lord Mayor's Fund has sent out, apart from cash for starving refugees, about £18,000 of medical supplies and drugs to the hospitals, but these are now becoming exhausted, and we must stand by our medical colleagues in this their need. Much has been given by doctors, chemists, and manufacturing firms, and we confidently ask for your readers' sympathy and active coöperation to do something for this mass of suffering. Goods in kind or money to buy drugs, dressings, or instruments will all be welcomed. Donations of money and gifts in kind may be sent to, and cheques or postal orders made payable to, H. Gordon Thompson, M.D., F.R.C.S., Hon. Secretary and Treasurer, the Lord Mayor's Fund for the Relief of Distress in China, 121, Westbourne-terrace, London, W.2.

We are, Sir, yours faithfully,

DAWSON OF PENN, JOHN KIRK,
W. MCADAM ECCLES, W. T. LISTER,
H. B. FAWCUS, EWEN J. MACLEAN,
GEORGE GASK, LOUISE MCILROY,
HORDER, JOHN A. RYLE,
ROBERT HUTCHISON, CUTHBERT WALLACE,
R. E. KELLY, D. P. D. WILKIE.

June 7th.

NASAL SINUSITIS AND MENTAL DISORDER

To the Editor of THE LANCET

SIR,—Whether sepsis in the nasal sinuses is a frequent or infrequent causal factor in mental disorder, only those whose practice is devoted to the care and treatment of certifiable patients can determine, and that this is rather a difficult problem appears from the widely differing conclusions from recent investigations. Yet the results actually obtained in practice leave no room for doubting that in some mentally disordered patients the determining cause was chronic sepsis in the nasal sinuses, where restoration of the patient's mentality followed disinfection and drainage of all the infected sinuses.

My practice for many years as a general physician specialising in laryngology afforded a large group of cases of nasal sinusitis with symptoms of systemic septic toxæmia (mostly those showing simple mental depression and poor concentration, but a considerable number also whose loss of memory and more marked mental depression was associated with suicidal impulses, &c.) and a small group comprising the very few who displayed severer degrees of mental aberration—of the certifiable category.

My own first case was encountered in 1911, the patient being a young bank clerk with delusions of "having committed unpardonable sins"; he thought that he was a dead man and, refusing food, required forcible feeding. He had chronic pan-sinusitis, but in a few weeks after all his sinuses had been opened and disinfected his mental condition cleared up although quite normal mentality was not attained for six months when he returned to his work and never relapsed.[1]

Yet more striking examples have been recorded by others[2]—e.g., by the late Dr. Henry Cotton at Frenton, New Jersey, and by Dr. T. C. Graves of Birmingham, notes of whose cases are recounted in my "Chronic Nasal Sinusitis in Relation to General Medicine," together with a summary of Pickworth's researches.[3] These afford histological and pathological evidence why it is that septic infection of the sphenoidal sinuses and posterior ethmoid cells are peculiarly prone to determine mental disturbance, owing to toxic absorption if not actual invasion of the organisms through the mucosa of the infected sphenoidal sinus, via the pituitary stalk

[1] Chronic Nasal Sinusitis in Relation to General Medicine Bristol, 2 ED. p. 44.
[2] *Ibid*, p. 26.
[3] Watson-Williams, P., and Pickworth, F. A., *Brit. med. J.* 1928, 1, 931.

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to the region of the third ventricle. Nevertheless because accurate investigation of the presence of operative sepsis in the sphenoidal sinuses (and posterior ethmoid cells) appears likewise a stumbling-block to many clinicians who consequently are driven to rely on radiograms for their diagnosis, a chronic infection of these nasal cavities with little purulent discharge may readily escape detection. On the other hand maxillary antral infection with copious purulent discharge seldom causes marked mental disturbance.

I do not presume to suggest in what percentage of the certified paranasal sinusitis is the dominant factor determining insanity, but surely it is of the utmost importance, however small the actual percentage may be, that the sinus infection be correctly diagnosed and properly treated in those patients who can thereby be restored to mental soundness, and business capacity. I suspect that in a good proportion of suicides "during temporary insanity" the determining cause of the overwhelming depression is toxæmia from sinus infection, especially sphenoethmoidal, but the insanity is discovered too late in coroner's courts, and post-mortem examination of the sinuses is hardly ever made and hence such a source is left undiscovered.

I am, Sir, yours faithfully,

Clifton, Bristol, June 4th. P. WATSON-WILLIAMS.

NUTRITION AND DISEASE IN DENMARK

To the Editor of THE LANCET

SIR,—In THE LANCET of April 9th Dr. Hindhede disputes the calculation of the Danish Department of Statistics on one point—namely, the consumption of meat in 1918. He does not dispute the important fact of the unusual consumption and uniform distribution of milk and butter in this "year of health." I have shown Dr. Hindhede's remarks to the director of the department (E. Cohn), who assures me that account was always taken of the effects of production, import and export. It is courageous of Dr. Hindhede but not convincing when he puts his personal impressions and those of his followers against the scientific judgment of the Department of Statistics. His last retreat is his "own feelings on the low-protein diet" and I cannot fight with statistical weapons against this, but I know that there are many families in Denmark living on mixed food, with much meat and milk, who are as well and happy as the Hindhede family, and I know that Dr. Hindhede's diet is not under strict control. He has been seen to take great portions of meat (especially fried duck) to strengthen himself before his lectures. People who are not under control do not know what they really eat. I met a brave doctor who told me he was a vegetarian, but I learned from his wife that he did not count the meat meals he consumed four or five evenings every week when he went out.

Even if Dr. Hindhede remained healthy and arrived at 100 years on a diet of skim milk, potatoes, bread, and margarine, it would not prove anything because experiments with single persons are of poor value. In a Rumanian city which I visited the year after the research made there by Dr. Aykroyd, 5 per cent. of the population suffered from pellagra, and 95 per cent. were apparently healthy; nevertheless all of them got exactly the same food. Even if their food is low in value most people escape harm if their assimilation, combustion, and excretion are good, and until they meet strain or illness. It is this fact which makes the campaign against pellagra so difficult in Rumania. The sufferers say—with Hindhede—that the food must be good enough, because a sister, a brother, or a husband feels healthy on the same food. Albert Szent-Györgyi is right when he says (*Dtsch. med. Wschr.* Nov. 26th, 1937), supporting the views of Sir John Orr, that the best food is that on which great communities of people have the lowest mortality and morbidity. We have no better example for this than the great Danish experiment during the war.

I am, Sir, yours faithfully,

JOHANNE CHRISTIANSEN.

Copenhagen, May 27th.

TRAUMA AND TUBERCULOSIS

To the Editor of THE LANCET

SIR,—The report of the meeting of the Tuberculosis Association which appeared in your issue of May 28th (p. 1223) contains the following statement by Dr. J. Browning Alexander: "Apart from stabbing or fracture of a rib a healthy lung did not rupture." In controversion I would like to draw Dr. Alexander's attention to two articles (*Brit. med. J.* 1934, **2**, 629; 1936, **1**, 461) in which cases reported during the past 100 years are quoted and recent cases are described. It will be seen from these that not only can a healthy lung be bruised but large cavities filled with blood, and even partial or complete severance of a lobe can be caused by trauma and this *without any sign of injury to the chest wall.* Pulmonary trauma appeared to me to be so important from both the medico-legal and the clinical aspects that I suggested in 1934 that the problem should be considered by the science committee of the British Medical Association.

I am, Sir, yours faithfully,

Wigan, June 4th. W. E. COOKE.

BLOOD TESTS IN PATERNITY CASES

To the Editor of THE LANCET

SIR,—Your interesting reference on May 28th to the first case in the law courts of this country (May 16th, 1938) in which a blood test was applied to exonerate a defendant in an affiliation suit deserves the widest publicity, and your comments should do something to extend the use of these tests. I am personally interested in this matter because I endeavoured as long ago as November, 1936, to move the Home Office to take action in introducing these tests in our law courts. With this purpose I wrote to the Home Secretary, Sir John Simon, on Nov. 17th, 1936, pointing out that "the determination of paternity by blood tests had been used abroad for some considerable time and was in common use in Europe and the United States, that it was easy of application and that it was possible in a proportion of cases, probably at least one in three, where a man is falsely accused of paternity, to state with complete certainty by a blood examination that he could not have been the father." I also asked Sir John to receive a small deputation, explaining the points of my memorandum and the measures suggested. The Home Secretary at that time was very much occupied with certain Bills for which he was responsible, and although he made a very courteous reply no action was in fact taken by the Home Office.

The matter was reopened by a question in Parliament which you reproduce in your issue of June 4th. Referring to the case already cited, the hon. Member for West Leyton asked whether the Home Secretary "proposed to take any steps to encourage or discourage

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the use of the test in similar cases." The Under-Secretary for the Home Office replied as follows:

"My right hon. friend has seen newspaper reports about this case. There has never been any doubt that if each of the parties to affiliation proceedings is willing to submit to a blood test evidence as to its results is admissible; and the publicity given to the recent case will, it is hoped, make the possibilities of the test more widely known to magistrates and others concerned. Legislation would, however, be required to make blood tests compulsory in cases of dispute as to paternity, and my right hon. friend can hold out no prospect of introducing legislation on this subject."

On June 2nd I put the following question and received the following answer:

Sir ERNEST GRAHAM-LITTLE: To ask the Secretary of State for the Home Department, whether he will consider the desirability of officially informing magistrates by circular throughout the country of the validity and value of blood tests.

Sir SAMUEL HOARE: I think that the courts are aware of the possibilities and value of these tests to which full publicity has already been given, and I do not think that any further action on my part is called for.

These answers bear out your statement that "the test is not likely to be fully used until the law is altered to give magistrates discretion to order it as a condition of continuing to hear the application." That the law should be thus altered is I submit clear.

In a very interesting session of the Medico-Legal Society on April 22nd, 1937, the case for employment of the blood test was ably put by medical members and usefully discussed by legal members. Some of the difficulties urged by the legal speakers were: unfamiliarity of the tests on the part of magistrates; difficulty of inducing the mother to coöperate, inasmuch as she could gain nothing by the test and might conceivably succeed in the absence of the test; the difficulty of finding a pathologist capable of carrying out the somewhat delicate examinations required; and of course the expense involved. A last difficulty cited may perhaps be no longer valid if the law of evidence is altered to allow of written reports being submitted in court without the presence of the writer, in this case of the pathologist making the test. The remedies proposed for these difficulties were:

(1) That magistrates should have discretion to make the coöperation of the mother a condition of her application being heard.

(2) The result of the test should be evidence only if it were conclusive against paternity.

(3) A certificate should of itself be evidence without the necessity of calling the pathologist himself as witness.

(4) The tests should be done at the public charge.

Another legal speaker of great authority emphasised the point that to establish the test it would be necessary to compel the coöperation of the mother, but he declared that "there should be no difficulty about this when its importance was established." The same speaker pointed out that the test would be useful in other cases besides paternity—e.g., in divorce a male petitioner might base his case on the birth of a child which the tests might show could not be his, but he was not allowed to give evidence to this effect. Blood tests under a High Court order in all three persons involved would obviously be extremely useful.

I am given to understand that in many countries in Europe the court can order the performance of the tests, which thus become an instruction of the court and no onus is placed upon the litigants. The scientific witness is a court witness and not a party witness.

That time and money would be very frequently saved by the tests and better evidence obtained is indisputable. In the instance you have cited the case collapsed immediately upon the performance of the test, and the reliability of the evidence given by scientific blood tests is obviously immeasurably greater than the "evidence" commonly relied upon in the absence of the tests—e.g., resemblance between the accused man and the child in paternity cases. It is sincerely to be hoped that the Home Office will not persist indefinitely in its refusal to promote or to accept legislation on this subject.

I am, Sir, yours faithfully,

Wimpole-street, W., June 3rd. E. GRAHAM-LITTLE.

FEMORAL THROMBOSIS

To the Editor of THE LANCET

SIR,—In the extracts from Mr. R. T. Payne's Buckston Browne essay published in your issue of May 28th no reference is made to the age-incidence. I do not know whether this is considered in the original paper, but I fancy that one reason why the results of his investigation showed the unsatisfactory conclusion "that circulatory recovery is never complete after so-called deep femoral thrombosis" may be that his cases did not include any young children; for I happen to have had one such case in which the circulation seems to have recovered completely.

In February, 1931, I had as a patient a baby of 7 months with acute osteomyelitis of the lower end of the left humerus, pus being also present in the elbow-joint. After operation she developed a septicæmia or pyæmia with several fixation or metastatic abscesses. Finally she developed a solid œdema of both lower extremities, the œdema involving also the vulva and lower abdominal wall; a typical bilateral deep femoral thrombosis. Eventually she made a satisfactory recovery, and the circulation of her lower limbs seems perfect at the present time. She also has almost perfect movement at the elbow, though the epiphysial growth has been somewhat interfered with.

I have good reason to remember this case, for it was actually the first of my "hopeless" cases to recover after, and apparently as a result of, injections of vitamins A and D. Perhaps more than any other case it encouraged me to persevere in the long investigation into this form of therapy, the results of which were published in THE LANCET of March 12th last.

As, according to Mr. Payne, the treatment of the later stages of femoral thrombosis seems to demand the resources of a well-equipped electrotherapeutic or massage department, it may be worth while to give details of a case that I treated in 1930 with injections of Contramine (B.D.H.) with quite striking results. In fact until Mr. Payne's paper set me re-reading my notes and reviewing the case I had not realised how striking the result had been.

Mrs. A, then aged 27, in 1920 had a white leg after her fifth confinement. After her sixth confinement in 1923 she was in bed for six months with both legs involved, and in the next year she had a dead baby though no white leg followed. The year 1925 however saw her in bed for about eight weeks with an attack after the next confinement, and in 1928 she had another baby followed by a rather worse attack of phlegmasia alba dolens. She was therefore a well-established case when I first attended her for

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a miscarriage in 1930, for quite apart from her periods in bed she constantly suffered in varying degree from the pain and swelling so well described by Mr. Payne.

On March 5th, 1930, she had a complete miscarriage at about four months. She did well, but a fortnight afterwards developed a phlebitis in the left leg—not a true phlegmasia alba dolens. In spite of treatment this gave her so much pain that she was not able to get up for more than an hour or so a day. On May 25th I therefore gave her an injection of contramine which seemed to cause some improvement, and on June 1st I gave her a second injection. The next day she did the family washing without much trouble and seems to have been almost free from pain ever since. She has certainly since had a confinement and a miscarriage without any return of the trouble, and the crippling pain and swelling of the right leg—which was always the worse of the two—has disappeared also. During the past eight years she has managed to do the work for her large family with nothing worse than slight swelling of the right leg at the end of the day, but the leg still shows a tendency to develop painful indolent ulcers after slight injuries.

I know that one cannot found a method of treatment on one result, however brilliant or convincing; but such a case as the foregoing, almost fortuitous yet well tested by time, cannot help raising the hope that chemotherapy may yet provide us with some drug which will arrest and even reverse the process of fibrosis which is presumably at the root of the trouble caused by so-called deep femoral thrombosis.

I am, Sir, yours faithfully,

Winsford, Cheshire, June 2nd. W. N. LEAK.

THE FIRST APPENDICECTOMY

To the Editor of THE LANCET

SIR,—In reference to the annotation on p. 1286 of your issue of June 4th, I may be wrong but I have an idea that the first appendicectomy en froid in this country was done by Charters Symonds. If so, perhaps one of my Guy's colleagues will verify and give the date?

I am, Sir, yours faithfully,

Cardiff, June 3rd. A. W. SHEEN.

VENOUS THROMBOSIS AS A SIGN OF VISCERAL CANCER

To the Editor of THE LANCET

SIR,—Your issue of Feb. 19th contained an annotation directing attention to a valuable article (*Bgham med. Rev.* 1937, **12**, 259) in which Dr. A. P. Thomson insisted upon the significance of spontaneous venous thrombosis of the limbs in the diagnosis of visceral cancer and deplored the fact that this phenomenon, to use your words, "has been well-nigh forgotten of recent years, and . . . is generally ignored in modern practice."

In his letter of March 5th Thomson quoted Trousseau to the effect that the sign "might occur with cancer affecting any internal organ whatever." Your annotation referred the primary growth in one of his patients to the *head* instead of to the *tail* of the pancreas, and it may be of interest to record a case exhibiting Trousseau's sign, in which *head* of the pancreas was in fact the site of the primary neoplasm.

The patient came under my care two days after Thomson's letter was published, and more than a fortnight before I had an opportunity of reading any of the correspondence. He suffered from recurrent obliterative phlebitis, the spontaneous venous thrombosis having occurred twice in each lower limb. Apart from an enlarged liver and loss of weight there was nothing else upon which to base the diagnosis; there was no palpable growth, icterus, anorexia, pain, or vomiting, nor any clinically recognisable distension of the gall-bladder; yet the diagnosis of primary impalpable malignant neoplasm with secondary hepatomegaly, though not allowed to pass unchallenged, was formulated with very considerable confidence, and was shown at necropsy to be correct. The condition revealed was primary carcinoma of the head of the pancreas, abdominal carcinomatosis, and obstruction of the inferior vena cava.

I appreciated the value of this little-known sign before I was aware that it had been described and correctly interpreted by Trousseau, or that he himself had shown it in his last illness.

Despite Dr. Parkes Weber's statement (March 5th) that "it seems that nowadays in the numerous cases of visceral cancer in hospital wards, observations confirming the truth of Trousseau's pronouncement are seldom of any practical diagnostic value," I should like to insist on the significance of spontaneous recurrent venous thrombosis in the diagnosis of malignant disease. Prof. Ryle is indeed correct in his contention that the association of spontaneous venous thrombosis and cancerous disease of the viscera is rare (otherwise it is legitimate to infer that the significance of the association when it *did* occur would be better appreciated); nevertheless, when present, Trousseau's sign goes very far to justify a diagnosis of cancer. This makes it all the more necessary to have a clear conception of what the sign consists in. A single spontaneous venous thrombosis of a limb, even in the presence of symptoms referable to visceral disease, though highly suspicious, does not in my opinion constitute the phenomenon of Trousseau, and is not necessarily indicative of malignant disease of a viscus. The sign, as I understand it, consists in spontaneous *recurrent* obliterative phlebitis of a limb or limbs, with or without symptoms referable to visceral disease. When this sign is unequivocally present the diagnosis of carcinomatous visceral disease is usually (according to Trousseau, always) correct. When it is observed the clinician should hold very tenaciously to the diagnosis of malignancy and should not permit himself to be diverted from the diagnosis until he is confronted with conclusive contradictory evidence.

I am, Sir, yours faithfully,

Liverpool, May 30th. R. COTTER.

THE KETTLE MEMORIAL FUND

To the Editor of THE LANCET

SIR,—In the issue of your journal dated May 28th, 1937, an appeal was made to the friends and admirers of the late Prof. E. H. Kettle, F.R.S., for subscriptions towards a memorial fund. There has been a generous response to this appeal and a total sum of £730 18*s.* 6*d.* has been received. This sum has been invested in 3 per cent. Redemption Stock 1986–96 and a trust fund has been established with the following trustees: Prof. J. H. Dible, Dr. W. E. Gye, F.R.S., Prof. G. Hadfield, Prof. W. D. Newcomb, and Colonel A. H. Proctor.

It was decided by the committee that the best method of commemorating Prof. Kettle would be by an annual lecture to be delivered in rotation at the medical schools with which he had been associated, that is, the British Postgraduate Medical School, St. Bartholomew's Hospital medical school, the Welsh National School of Medicine, and St. Mary's Hospital medical school; and that the choice of lecturers and arrangements for the lecture in any year should be made by the school at which the lecture was to be delivered.

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We are informed that the British Postgraduate Medical School have invited Prof. W. W. C. Topley, F.R.S., to deliver the inaugural lecture. He has agreed to do so and the lecture will be delivered in the autumn.—I am, Sir, yours faithfully,

A. H. PROCTOR,
June 1st. Secretary to the Memorial Committee.

GASTROSCOPY

To the Editor of THE LANCET

SIR,—Your leading article of Nov. 20th led to a lively correspondence, and even at this late date I would like if I may to comment on some of the opinions expressed by Dr. Denys Jennings. I was amazed at his statement (p. 1278) that "Schindler . . . finds that carcinoma of the stomach can be controlled by the office use of the gastroscope," for I cannot believe I ever wrote such nonsense. After I had recovered a little bit I read carefully the chapters on Early Diagnosis, and on Systematic Campaign against Gastric Cancer, in my book (pp. 237 and 258) to discover which sentence Dr. Jennings had in mind. But I found nothing.

Let me say that I agree with him in many points. Against the opinion of such excellent men as Hurst, Faber, and Konjetzny, I most definitely believe that chronic gastritis has nothing to do with the ætiology of chronic gastro-duodenal ulcer, and even nothing to do with the origin of pernicious anæmia. I believe I have evidence in support of this opinion. On the other hand, I fully agree with the same authors that gastric carcinoma often develops on the soil of chronic gastritis. Not long ago I observed the case of a surgeon who had suffered for ten years from epigastric distress: no hydrochloric acid was found; in the last three years a filling defect of the greater curvature developed and grew larger; gastroscopy revealed a well-defined, not ulcerated, polypoid tumour in a completely atrophic mucosa; operation and microscopic examination confirmed the gastroscopic diagnosis. Could a careful observer like Gutzeit have overlooked these frequent cases? I do not believe so. I admit of course that there are cases of carcinoma that are found to be inoperable five days after the onset of the very first symptoms, and I have repeatedly mentioned them in my book.

I agree with Dr. Jennings—and disagree with Dr. Hancock (p. 1403)—about the great value of clinical observation, even against the so-called evidence of the histologic examination. This refers not only to the connexion of ulcer and carcinoma but even to the histologic conception of chronic gastritis (see "Relationship of Histologic and Gastroscopic Findings in Diagnosis of Chronic Gastritis," *Amer. J. digest. Dis.* 1936, **3**, 153), in which I evidently disagree with Konjetzny.

Dr. Jennings fears that the work of my adherents will start a "gastroscopical gastritis racket." Here in America one calls "racket" a union to get personal advantages for its members by dishonest means, and it seems to have the same meaning in England since he writes of "fame and fortune." Probably he does not mean to attack me. But are we to suppose that men like Hurst, Konjetzny, and Katsch (whose important referat of Paris he evidently has not read), or such a noble statesman as Faber, should participate in a "racket"? Even a scientific adversary has to read only a few lines by Konjetzny to become convinced of his scientific integrity. The same is true of Gutzeit as well as of the other men mentioned.

I believe, however, that Gutzeit has made a serious, dangerous mistake. In my book of 1923 I describe the splendid results obtained with my old rigid gastroscope. Has Dr. Jennings ever wondered why I should have given it up, and should have tried over long, very long, years to develop an entirely different instrument? After 1922 I had no mishap myself. But I knew that such mishaps had occurred and could occur again at any moment, and that they did occur in the hands of inexperienced workers. I understood that the risk of them condemned this wonderful method of examination to remain a laboratory method; I accepted Boas's opinion. Dr. Jennings knows the final success. I realised that the optical qualities of the new instrument were not so good as those of the rigid one (see the chapter on General Optical Problems in my book). But what was to be done? Certainly we could *not* return to the dangerous rigid instruments, but must develop a better optical system in the flexible gastroscope. This I have achieved with the construction of the new 50° gastroscope.

With full intention I omitted a discussion of the rigid instruments in my book; I did not want to hurt Korbsch, who has such great merits. But now, when a man so experienced as Gutzeit advocates the rigid instrument because he himself has had no accident and because he is not able to see the broader aspect of the situation, I cannot be silent any longer. Here in the United States and in Canada, where very few Korbsch instruments are used, two deaths following the use of a Korbsch gastroscope have already occurred—one of them, together with another mishap, being reported by H. T. Thorlakson (*Canad. med. Ass. J.* 1937, **36**, 345).

I am, Sir, yours faithfully,

RUDOLF SCHINDLER.

Associate Professor of Medicine, the University of Chicago.

MEDICAL EDUCATION IN INDIA

To the Editor of THE LANCET

SIR,—In his address at the annual meeting of the Manchester Medical Society on May 4th Sir Richard Needham made very appropriate suggestions about medical education in India (*Lancet*, May 21st, p. 1196). It remains to be seen whether the Indian Medical Council will pay heed and take complete control, not just by making an imperfect register but by taking adequate possession of all institutions. That means including the licentiates in the register along with the graduates as one unit without any distinction. The next step would be for the Council to set up one uniform standard of medical education, whether for licentiates or graduates, throughout all the presidencies and provinces. The licentiates are at present looked down upon for not possessing the university cachet; but they are adequately trained and qualified in Western medicine to practise medicine, surgery, and midwifery, with the same responsibilities as those of the graduates. Improved facilities have made the licentiates of the last decade far better equipped than the old L.M. & S. class; the examinations are not far from the graduate standard and the examiners are often the same for both. The licentiates have proved their metal in civil, military, and government hospitals, dispensaries, schools, and colleges; the health of India cannot progress without their help. It is they who come in direct contact with the multimillions of the poor.

I am, Sir, yours faithfully,

F. TARAPORVALA,
Ex-President, All India Medical
London, S.W., June 2nd. Licentiate Association.

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PARLIAMENTARY INTELLIGENCE

AIR-RAID PRECAUTIONS

ON June 1st when the House of Commons went into Committee of Supply on a vote for air-raid precautionary services, Sir S. HOARE, Home Secretary, said that they were getting near the half-way mark of the million volunteers for which he had appealed two months ago. By far the greater proportion had had training or were in the process of training. So far as first-aid and anti-gas measures were concerned, 90,000 men and women had been trained by the St. John Ambulance, 36,000 by the Red Cross, and in addition 11,000 doctors, 1300 dentists, and 22,000 nurses had passed through air-raid precaution courses. They intended now to make a much more intensive campaign for stimulating recruiting. In particular they hoped to see started in the course of the next few weeks a representative organisation to provide a clearing house for women's voluntary work of this kind. In connexion with the danger of the high explosive bomb, the Home Office had made a most careful analysis of the terrible experiences of Barcelona and had tried to take into full account the lessons of those experiences. It had always been the Governments view that dispersal was a safer policy than that of concentration of large numbers of the population into certain spots. If there were to be shelters they should be carefully sited, and it was essential that the local authorities should make surveys of shelter accommodation in their areas. In recent weeks a survey had been made in the Boroughs of Holborn, Stepney, and Wandsworth. This had shown that in Holborn there was ample accommodation in basements and cellars for the people who might be in the streets or whose houses were not adaptable. In Stepney there were 6900 basements that might be adapted, and in addition there were underground places of storage which with certain improvements might be used for shelters on a bigger scale. In Wandsworth there was less shelter accommodation available, but much more open spaces for trenches and dug-outs. There were in London 8261 acres of open spaces, and it was calculated that in a considerably less area adequate trench and dug-out accommodation could be found over and above the basements and cellars for between 1,250,000 and 1,500,000 persons if it was properly sited. One of the duties of the local authorites would be to have plans ready for emergency with the open spaces surveyed in detail, the material ready to hand for digging trenches and dug-outs, and gangs of labour allocated on the spot so as to carry out this work with the least possible delay. Outside the L.C.C. area there were 58,000 acres of open spaces that might be used in the event of emergency. The Ministry of Health had recently undertaken a survey of the hospital accommodation of the country with a view to air-raid precautions. Although not yet entirely complete, this tended to show that the old distinction between casualty hospitals and base hospitals could not be fully maintained in air warfare, and that for air-raid precautions the Ministry of Health, with all their expert knowledge and personnel, should be the responsible department. It had been suggested that casualties instead of being dealt with in the London area ought to be taken as quickly as possible outside the area of the London attacks. It might well be that the attack would be so formidable that it would be difficult for the staff and the doctors of the casualty hospitals to carry on their work. It had been suggested that casualty hospitals ought to be formed in the periphery of London on the lines of the tented hospitals in Etaples during the late war. The Government had already made some tentative inquiries as to whether the Universities of Oxford and Cambridge in conditions of that kind might not place the colleges at the Government's disposal. He had asked a number of hospital experts to look at this proposal and several others of the same kind, and to give him their views as to which they thought most practicable. These experts were Sir Charles Wilson, dean of St. Mary's; Mr. Girling Ball, of St. Bartholomew's; General MacArthur, the Director-General of Medical Services in the War Office; Sir Frederick Menzies, of the London County Council, and the principal medical experts at the Home Office and the Ministry of Health. As to the more general precautions against air raids the Government would shortly issue directions which should be extremely useful to the hospitals throughout the country. In regard to the question of evacuation there were two schools of thought. One said they should take the parents as well as the children out of the danger zone; the other said it would be better to get the children out very quickly and that the fathers and mothers would be prepared to let the children go. He (Sir S. Hoare) would not give an answer as to which school was right; he wished to hear the views of the House on that point. Dealing with the need of ensuring the working of the Government machine in an air war, Sir Samuel said that they had advanced very far with their arrangements for an invulnerable battle headquarters, and had also made plans which could instantly be put into operation for coördinating the various branches of civil defence in the War Cabinet and avoiding delay and confusion in the execution of urgent measures. He appealed to every hon. Member to give his aid in this national effort to create an effective system of defence founded upon the two-fold base of self help and voluntary endeavour.

Mr. NOEL BAKER, in moving the reduction of the vote by £100, said the measures of which Sir S. Hoare had spoke were not enough. They ought to have a policy of constructing deep direct-hit-proof shelters for a large part of the population. He had heard that all over the country there was a shortage of competent teachers, of equipment, and of almost all else that was needed to make the training of the vast army of a million air-raid precaution volunteers a real thing. There was a great over emphasis on gas, and there had been virtually no start in house to house instruction.

Sir JOHN ANDERSON, chairman of the committee set up to advise the Home Office on the problem of evacuation, said that while this problem was so complex that the mere contemplation of it might at first produce a feeling of bewilderment, he did not take a pessimistic view. He had seen the vast organisation of National Health Insurance set up, and there were many lessons to be learned for the present purpose from the accomplishment of that great undertaking.

Dr. HADEN GUEST, another member of the committee on evacuation, said that air-raid wardens, first-aid parties, stretcher bearers, ambulance service drivers, and so forth, not only needed individual training but also practice in working together. The question of dealing with the possibility of attack by mustard gas depended upon the efficiency of the first-aid post organisation, and he wished for more information as to the preparations that were being made in that respect. To neglect the question of gas, and especially of mustard gas, would be exceedingly foolish and dangerous on account of the large number of casualties it might easily cause unless there was an adequate system of protection. The committee which the Home Secretary had announced for dealing with the hospital system was a very strong and useful one, and it was a pity it was not appointed a long time ago. There was not only the question of providing hospital accommodation but also of how the accommodation was to be controlled. How was control to be shared between the London County Council and the voluntary hospitals? In what way was the organisation in the rest of the country outside London to be controlled, and what was to be the authority? There was something to be said for making the control of the whole hospital services of the country a national

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matter. There was also the important question of how the hospital service required for air-raid precautions was to be coördinated with that which would still be required for civilians or for the Army, the Navy and the Air Force. What extra hospital provisions would be required under the conditions of a modern war? On anything like the scale of casualties which had occurred in Barcelona, they might get from one bomb dropped on a big centre of population as many casualties as in a first-class action in the Great War. The Government ought also to take some step to bring home to factory owners their responsibility for providing protection for their workers.

Mr. G. LLOYD, Under-Secretary, Home Office, replying to the discussion, said that the responsibility for the casualty hospitals was by the regulations that of the local authorities, and the base hospitals were the responsibility of the central government. The device for the protection of babies was now going into mass production. Arrangements had been made for a very great increase in the number of instructors. They were recasting and hoped considerably to improve the first-aid training, and they were aiming at a national standard for the members of the first-aid parties and those responsible for first-aid posts. They wanted to see model first-aid posts set up in each area, because they attached very great importance not only to theoretical training but to practice in the operation of the posts. Much detailed work had been done in the Home Office on evacuation. They had gone into the question with the railway companies and time tables had been worked out on the basis that 3,500,000 people could be moved 50 miles or more out of London by rail in 72 hours.

The use of road transport and the food problem in connexion with the evacuation had also been considered. Good protection could be had against blast and splinters by strongly constructed buildings if necessary reinforced with sandbags and the like. The local authorities would be required to provide such shelter as was necessary for those who lived in homes which were not strong enough to afford adequate protection. Local authorities had been asked to press on with the survey of this problem and special tests had been carried out in London. Plans were under consideration for the modified use of the tubes as transport and their limited use as shelters.

NOTES ON CURRENT TOPICS

Treatment of Blindness in Scotland

In the House of Lords on June 2nd Lord ALLNESS moved the second reading of the Prevention and Treatment of Blindness (Scotland) Bill, which has already passed through the House of Commons. This measure would enable local authorities in Scotland to take appropriate measures for the prevention and treatment of blindness and eye diseases generally. It would assimilate the law of Scotland to what had been the law of England since 1936. There were in Scotland to-day 8737 blind people, many of whom, had this Bill been in force, would not have been suffering from that dread affliction. There had recently been established in Edinburgh, through the munificence of one of her public-spirited citizens, the Ross Foundation for the study of the prevention of blindness. This Bill would tender the practical application of the research contemplated by the Foundation not only obtainable but almost inevitable. The Ross Foundation he was informed was unique in these islands, and it was a fortunate chance that this institution would substantially synchronise with the passage of this measure.

Registration of Funeral Directors

On June 2nd in the House of Lords Lord HORDER moved the second reading of the Funeral Directors (Registration) Bill. He said that the purpose of the Bill in brief was to set up a statutory Board to control the training and admission to a register of those persons who carried on the business of an undertaker or funeral director. It was believed that it was in the public interest that the necessary services rendered to the public by these persons should be protected and their status raised by such a Board. Between the moment of death, up to which the doctor was responsible, and the point at which disposal ultimately took place by burial or cremation, where the Church took responsibility, there was a variable period during which no one was responsible. It was in order to remove this anomaly that this Bill had been framed. He was claiming their Lordships' support for this Bill in his capacity as President of the Council for the Disposition of the Dead, a body formed in 1931 and incorporated three years later. The chief objects of this organisation were the revision and the codification of the law governing the disposal of the dead and the improvement of the status of those engaged in that profession. A large number of associations and societies were affiliated to that body: The National Association of Funeral Directors, the Federation of Cremation Authorities in Great Britain, the British Institute of Embalmers, the Royal Colleges of Physicians and Surgeons, the Corporations of the City of London and of Liverpool, the Coroners' Society, and the Royal Institute of Public Health. The Chief Rabbi was also represented on it. The Board would have the power of imposing penalties, but these were only to be inflicted after full inquiry and there was the usual right of defence and appeal. It was suggested that the Minister of Health should appoint the first chairman of the Board and should also appoint three of the members of a panel of seven, the remaining three members being appointed by the main bodies of funeral directors now existing. The Board would initiate and control the teaching of all those subjects of importance in the efficient carrying out of the work of funeral direction. It would satisfy itself by examination or otherwise of the ability and competence of those whose names were entered on the register.—Lord STRABOLGI said that the Labour Party opposed the Bill because it would create, or tend to create, a monopoly of those who performed the last rites for the dead and keep the costs of funerals up, whereas they ought to be lower. The whole question of the burial of the dead in this country deserved the attention of the Government and a very strongly manned official inquiry was needed. There has been no such inquiry into the whole subject since 1848. Death benefit should be automatic for all persons insured under the National Health Insurance Acts and the Ministry of Health should set up a small department under a functionary called the Funeral Commissioner, or some such term, who would watch over and advise the profession concerned with the disposal of the dead.—The Earl of MUNSTER said the Home Secretary attached considerable importance to the public health aspect of this matter, but he was advised that there was no cogent medical reason for the proposals outlined in the Bill. Various sections of the Public Health Act, 1936, gave immense powers to local authorities dealing with the disposal of the dead. He was not aware that there were any grounds of public health which made it desirable to support this Bill and it was necessary before they did so that strong reasons of general public interest should be given to justify the stringent regulations proposed under the measure. Common experience had shown that the duties of disposal of the dead were efficiently and decently carried out. The Government knew no reason which would warrant the conversion of this trade into a close corporation and therefore they were opposed to the second reading of the Bill.—Viscount SAMUEL suggested that the Government might consider the appointment of a committee of inquiry into the subject.—Lord ARNOLD said that Lord Munster had stated that this Bill was not required on health grounds, but he did not take that as the last word. Lord Horder had great experience of these things and he would not bring forward a Bill unless he had grounds for the opinion that it was desirable from the point of view of public health.

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At any rate the Bill should be given a second reading and go to committee. If then the various points were not satisfactorily determined, or more information was needed, the measure could be rejected on third reading.—Lord HORDER said that he had never supposed that this Bill could cover all the points connected with the important matter of burial, but much legislation was postponed indefinitely on the same plausible pretext. If he could believe that Lord Strabolgi had either the power or the opportunity to press the inquiry which he suggested within a measurable time he would support him. It was difficult to see how this Bill could have the effect of creating a monopoly or of raising prices. Perhaps he had made a mistake in not being more explicit about some of the abuses which he knew to exist at present during the interval between the moment of death and the proper sanitary disposal of a dead body. He could a tale unfold in that matter. He thought that Lord Munster who spoke for the Government minimised the significance of this interval in terms of public health. The Ministry of Health was rather far removed from, and was not immediately concerned with, those very anomalies which came to the notice of medical men in this respect. He (Lord Horder) could not say from his own experience that half-time funeral direction was a thing to encourage, but there was no restriction in the Bill against it. He would however not press the measure to a division. —The Bill was rejected without a division.

Health Services in Jamaica

In the House of Lords on June 2nd Lord OLIVIER called attention to the conditions in Jamaica. He said that there had been of recent years much controversy and several schemes of reform in connexion with the provision of public medical aid. It was an indication of failure that well-meaning estate proprietors should now be proposing to provide hospitals and estate medical officers for their own employees. That was the system under slavery, and since slavery it had never been found, and could not now be found, workable. There was a long-established Government medical service and there were one or more public hospitals in each parish. It was desirable to complete this organisation by a system of health insurance and panel relief. Strong efforts were already being made locally to induce the Government to adopt this policy. That, and not a reversion to the old system of private estate medical officers, was the line that ought to be followed. A great deal of money had lately been spent and more was intended to be spent out of loan funds upon the public hospitals. The old estate hospital had the worst possible reputation, being commonly known as "the hot house." Any hospital not under control of the superintending medical officer and criticism by the Legislative Council through the elected member for the parish was liable to degenerate both in efficiency and equipment. He hoped that the Secretary of State would insist on the Colonial Government introducing a proper scheme for the total reorganisation of this branch of provision for public health. Any provision by the estates should be merely subsidiary for purposes of first-aid and temporary accommodation. Proper equipment could not be expected in such estate hospitals.—Lord HARLECH said it had been suggested that large sums ought to be spent on public health, but any nine of the fourteen elected members in Jamaica—it did not matter what the officials or the Governor said—could veto and stop any expenditure whatever. The Colonial Office had no power to impose expenditure or taxation upon Jamaica under its present constitution. Such reforms had to be carried out with the assent of the elected members. That ought to be made clear in discussing these matters.—The Marquess of DUFFERIN AND AVA, replying for the Government, said it was quite clear that it was not housing conditions, the lack of trade unions, or any of the other comparatively subsidiary ills to which attention had been called in that debate which had caused the discontent in Jamaica. That discontent had been caused by low wages and the root problem must be the raising of these. That could only be done by raising the price of the product which the labourers produced. It was clear that if prices continued to be so unsatisfactory that the Colonial sugar producer was quite unable to make a livelihood or pay a proper wage. Something must really be done. But until it was shown that the Sugar Council was unable to raise the price of sugar it was in the opinion of His Majesty's Government premature to take decisive action in any other way. He could assure the House that this would not be the last that it would hear of the West Indian problem during the next few months.

In the House of Commons on June 1st the Infanticide Bill, which has already passed through the House of Lords, was read a second time.—The Royal Assent was given to the Sheffield Infirmary and Hospital Act on June 2nd.

The House of Lords adjourned for the Whitsuntide recess on June 2nd and the House of Commons on June 3rd. Both Houses will reassemble on June 14th.

QUESTION TIME

WEDNESDAY, JUNE 1ST

Diphtheria Inoculation in Liverpool

Mr. KIRBY asked the Minister of Health how many children in the city of Liverpool had been inoculated against diphtheria; what was the extent of the recent outbreak of that disease among children in the city; and whether he was satisfied that inoculation entirely prevented or minimised infection.—Mr. ELLIOT replied: I am informed by the local authority that the number of persons inoculated against diphtheria in Liverpool to the end of 1937 was 46,175, the majority of whom were children at the time of inoculation, and that 821 cases of diphtheria in children under 15 years of age were notified during the first quarter of 1938. I am advised that the value of artificial immunisation against diphtheria has received world-wide recognition and in communities in which the practice has been systematically followed until the majority of otherwise susceptible children have been immunised the incidence of the disease has fallen substantially.

Research into Industrial Diseases

Mr. ELLIS SMITH asked the Chancellor of the Duchy of Lancaster, as representing the Lord President of the Council, if he could make a statement on what further steps had been taken to deal with the industrial diseases reported on pages 144 and 145 of the report of the Medical Research Council for the year 1935–36 (Cmd. 5378); and what steps in particular had been taken to deal with silicosis and pneumoconiosis.—Earl WINTERTON replied: An account of the further progress of the investigations into industrial pulmonary diseases is given on page 163 in the report of that body for 1936–37 (Cmd. 5671), which was presented to Parliament in February. This also includes references to several technical papers in which results obtained in the various investigations have been published. As I have stated in reply to previous questions, one of the main items in the programme is an investigation into chronic pulmonary disease among coal-miners.

The Mark IV Respirator

Mr. JAMES GRIFFITHS asked the Chancellor of the Duchy of Lancaster, as representing the Lord President of the Council, if he could give particulars of the respirator known as the Mark IV respirator which was recommended for use by coal-miners; what tests had been carried out with this respirator under practical working conditions and at what collieries these tests were carried out; and whether the responsible authorities were satisfied that coal-miners doing laborious work could use these respirators without any ill effects upon their constitutions.—Earl WINTERTON replied: It is not possible to describe the Mark IV respirator, so as to distinguish it from other

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respirators, within the limits of a reply to a Parliamentary question. The respirator was evolved after exhaustive investigations and trials carried out under practical working conditions at factories and sandstone quarries as well as at six coal-mines in Somerset, South Wales, and Kent, by the Chemical Defence Research Department under arrangements made by the Department of Scientific and Industrial Research. The trials indicated that the respirator would be suitable for use by operatives in any of the industries covered by the trials. The respirator is of light weight and has an exceptionally low breathing resistance, and I am advised that it is therefore likely to be more suitable for use by coal-miners or other workers engaged in laborious occupations than any previous design.

Epidemics of Milk-borne Disease

Mr. LIDDALL asked the Minister of Health what epidemics of infectious disease had been attributed to spread by milk during the five years 1933–37 in England and Wales; how many cases were involved and how many deaths resulted; and what steps he had taken to prevent a recurrence of such milk-borne outbreaks.—Mr. BERNAYS replied: With regard to the last part of the question it would not I fear be possible to give a full reply within the limits of a Parliamentary question and answer, but I would call my hon. friend's attention to various measures such as the Agriculture Act, 1937, and the vigorous supervision of milk-supplies by medical officers of health. The following is a tabular statement in answer to the first and second parts of the question:—

Place.	Year.	Disease.	Notifications.	Deaths.
Hyde	1933	Scarlet fever.	43	4
W. Hartlepool	1933	Para-typhoid B.	24	1
Epping U.D. and R.D.	1933	„	22	None.
Chelmsford B. and R.D.	1935	Scarlet fever.	487	6
Eton R.D. ..	1935	„	100	2
Kettering U.D. and surrounding district.	1936	Enteric.*	9 cases in U.D. and 23 in district.	1 death among the 9 U.D. cases.‡
Bournemouth, Poole, and Christchurch	1936	Enteric.	718	51 among the residents.§
Doncaster ..	1936	Scarlet fever and tonsillitis.	135 cases of scarlet fever, 229 "sore-throat."	2 deaths "definitely associated with the outbreak."
Wilton (Wilts)	1936	Gastro-enteritis.	About 100.†	None.

* Cream cakes thought to be vehicle.
† Disease not notifiable.
‡ Deaths in district not stated.
§ No information as to visitors.

Anti-Gas Respirators

Mr. WILSON asked the Home Secretary the main differences between a civilian respirator, a civilian duty respirator, and a service respirator; and if he would give a list showing which gases each kind would or would not keep out.—Mr. GEOFFREY LLOYD, Under-Secretary, Home Office, replied: The differences between the three types of respirator arise from the fact that they have been designed to meet varying requirements. The civilian respirator protects the wearer against breathing any of the known war gases, and is intended to be used on occasions when gas is present and a gas-protected room or refuge is not available or has to be evacuated. The civilian duty respirator has been designed for members of civil air-raid precautions services and others who might be called upon to carry out their normal duties in the presence of gas but are not likely to be continuously exposed to the highest concentrations. The service respirator is the pattern of respirator issued to the fighting services; the protection it affords is of the same kind as in the case of the civilian and civilian duty respirators, but the duration of its efficiency is longer and it has been designed to allow the wearer the greatest possible freedom of movement and the maximum use of his faculties. All these respirators will give protection against all types of gas which are likely to be used as war gases.

Mr. WILSON asked the Home Secretary how it was that the civilian respirator, which had been designed to give fully satisfactory protection against all types of gas which were likely to be used as war gases, did not protect against coal gas, exhaust gases from motor-cars, gases from sewers or drains, petrol vapour in confined spaces, ammonia, or similar toxic and noxious gases and vapours.—Mr. GEOFFREY LLOYD replied: The civilian respirator has not been designed to give protection against gases other than those likely to be used in war. Industrial respirators of special design and construction are needed against the other gases referred to and in many cases such respirators are limited to use against the particular gas for which they have been designed.

Mr. WILSON asked the Home Secretary whether each person having a gas mask was to be provided with an anti-dim outfit free of charge or, if not, by what means was the anti-dimming to be secured.—Mr. GEOFFREY LLOYD replied: The recommended method of preventing the misting over of the eye-piece of the civilian respirator is by the use of ordinary toilet soap rubbed over the inside of the eye-piece with a wet finger.

Children Burned by Sulphuric Acid

Mr. MESSER asked the Home Secretary if he had any statement to make regarding the accident in Southwark in which many children were burned by sulphuric acid from a carboy which fell from a lorry; and was he satisfied that the present regulations for the loading of goods vehicles were adequate for the safety of the public.—Mr. GEOFFREY LLOYD replied: This accident occurred on May 27th. I understand that sulphuric acid was spilt on the roadway from a lorry in which it was being conveyed and that twelve children who stepped or fell in it suffered burns for which they received hospital treatment. Only two of them were detained in hospital, and I am glad to say that their injuries are reported not to be serious. I understand that the question whether there was failure to comply with the existing regulations as to the use of motor vehicles is under consideration.

THURSDAY, JUNE 2ND

Validity and Value of Blood Tests

Sir ERNEST GRAHAM-LITTLE asked the Home Secretary whether he would consider the desirability of officially informing magistrates by circular throughout the country of the validity and value of blood tests.—Sir SAMUEL HOARE replied: I think that the courts are aware of the possibilities and value of these tests to which full publicity has already been given, and I do not think that any further action on my part is called for.

L.C.C. Grant to St. Paul's Hospital

Mr. GALLACHER asked the Minister of Health if he would state the circumstances in which the St. Paul's Hospital lost its grant of £8000 from the London County Council leading to its having to close down several wards; and why no public inquiry was held into the events which led to this action being taken.—Mr. ELLIOT replied: The grant referred to was payable by the London County Council to the St. Paul's Hospital in pursuance of arrangements made annually between the county council and the hospital for the diagnosis and treatment of venereal diseases. I am informed that in reviewing their venereal diseases scheme for the year 1937–38 the county council decided that it was no longer necessary to continue the arrangements with St. Paul's Hospital. The discontinuance or renewal of such arrangements is a matter within the discretion of the county council.

Slum Clearance

Mr. CRAVEN-ELLIS asked the Minister of Health how many of the 176,466 houses involved in slum-clearance orders had been acquired and demolished by local authorities; what had been the cost of acquiring these properties; how many owners were concerned and what was the total sum paid to them; and what was the net building area of the land acquired.—Mr. ELLIOT replied: Of the houses referred to 57,528 were to be demolished,

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after acquisition, by the local authorities and the remainder by the owners. By the end of 1937 about 104,000 of them had been demolished. The other particulars asked for by my hon. friend are not available.

Sex-distribution of Disablement Benefit

Mr. RIDLEY asked the Minister of Health if he could state the number of men and women, respectively, between the ages of 55 and 65 insured under national health insurance at January, 1938, and the number drawing disablement benefit between these ages.—Mr. ELLIOT replied: I regret that the complete statistics for which the hon. Member asks are not available. It is, however, estimated that the numbers of insured men and women in Great Britain between the ages of 55 and 65 at the date mentioned were about 1,500,000 and 400,000 respectively, and that of these about 105,000 men and 50,000 women were then in receipt of disablement benefit.

Maternity Services

Mr. JOEL asked the Minister of Health if he was satisfied that the new maternity services in the country were in full working order, and could he state any defective areas.—Mr. ELLIOT replied: According to the information in my possession, the service of salaried midwives under the Midwives Act, 1936, may now be said to be in effective operation throughout England and Wales, though there is a small number of areas in which the local authorities have not yet finally completed their arrangements with other bodies.

OBITUARY

V. H. W. WINGRAVE, M.D. Durh.

Dr. Wingrave, who died at Lyme Regis on June 1st in his eighty-first year, was well known both for his services to oto-laryngology and his lifelong interest in archæology. He was for many years dean of the Central London Throat and Ear Hospital and it was there that he contracted from a patient an infection which cost him his hearing and the sight of one eye. His retirement from hospital life however meant little if any relaxation in the pursuit of his many interests.

Vitruvius Harold Wyatt Wingrave was born at Coventry in 1858, was educated at the grammar school there, and went on to Middlesex Hospital from which he qualified in 1882 after taking honours in pathology and materia medica. Later he sat for the M.D. Durham. After a resident appointment at the City of London Hospital he joined the staff of Cooke's School and lectured for 25 years on physiology; an encounter there with Sir James Dundas-Grant led to an introduction to the Central London Hospital where he was in turn registrar, anæsthetist, pathologist, and physician, and a universally popular member of the staff. He wrote on many aspects of diseases of the ear and throat, both in the medical press and as associate editor of the *Annals of Otology*; later he collaborated with Sir William Milligan in his great work on diseases of the ear. During the late war he acted as pathologist at several military hospitals; he saw ten years' service in the Hon. Artillery Company. Having all his life taken a discriminating interest in natural history and archæology, on his retirement to Lyme Regis he became honorary curator of the museum of geology to such effect that he was later made a freeman of the town. From among his collection of fossils he presented to the Hunterian Museum a remarkable specimen of saurian rheumatoid disease. Among his hobbies were the collection of old book-bindings and archery; there was little he did not know about the history and construction of the bow. His humour and conversational ability made him a delightful companion.

Dr. Wingrave was thrice married and leaves two sons and a daughter.

ROBERT TAIT MACKENZIE, M.D., LL.D.

IN days when a man is happy if he can hold his own in a single department of knowledge the life of Tait Mackenzie is unusual in more ways than one. His achievements as anatomist, sculptor, and physical educator were related, but his range was nevertheless wider than most. A medical graduate of McGill in 1892, he worked as a hospital resident, as a ship's surgeon, and on the medical staff of the Governor-General of Canada before entering the anatomy department of his own university, where he also became director of physical training. In 1904 he was appointed to the University of Pennsylvania as professor of physical education, and he held this chair till 1931 when he became research professor. During this long period his mind was also at work in developing and expressing in sculpture his ideals of manly excellence. He exhibited at the Royal Academy and the Paris Salon in 1902. At the Olympic Games in 1912 he was awarded high distinction by the King of Sweden. It was not fortuitous that this Canadian-American who had done much by his teaching to revive the Hellenic tradition of physical culture should leave a legacy of art on both sides of the Atlantic. In this country are the beautiful Scottish American war memorial in the Princess-street gardens in Edinburgh, the statue of General James Wolfe in the Greenwich Royal Park, the war memorial at Cambridge, and sculptures at Balmoral and in the Ashmolean at Oxford. There are many memorials and statues of his in Canada and in the United States.

During the late war Tait Mackenzie served in the Royal Army Medical Corps with a major's commission, and in 1917 he coöperated with R. F. Fox in a book on "Physical Remedies for Disabled Soldiers." Other works by him were "Exercise in Education and Medicine" (1915) and "Reclaiming the Maimed" (1918). In the re-education of injured men the Canadians were early in the field. In England the principle of simultaneous treatment and training was not at first accepted, but later was amply justified. The "centres for treatment and training" opened by voluntary committees for men unfit for military service demonstrated, once for all, two great principles in social medicine, that vocational training ought to be combined with the treatment of wounded and invalided men, and that there was a place in industry for permanently subnormal workers. The American convalescent camps, profiting by these examples, were admirably organised. In the camps for their expeditionary force in France precise periods of residence were assigned to different illnesses, and a prime rule of practice was the orientation of each individual and recourse to occupation as an outlet for emotional stress. The same principles were observed in the arrangements for war invalids in the United States. In addition to mental stimulus and occupational training, physical remedies—hydrotherapy, electrotherapy, massage, exercises—were given a prominent place in each of the 45 hospitals allocated to the "division of physical reconstruction."

These vivid experiences in the task of restoration after the war gave a new impulse in more than one country to the study of physical medicine. It was

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clear that disabled men required for a complete recovery of health and working capacity a well-ordered period of convalescence between the hospital and civil life. But "new ideas are often contraband," and lessons are soon forgotten. Camps, the open sky, heat and cold, and physical and mental discipline are now being widely invoked as an invigorating régime for the nation; they have also been invoked time and again as a necessary restorative and curative régime for the injured and weaker members of the community. Tait Mackenzie's life-work served both these purposes, the education of the healthy and the re-education of the injured. To these tasks he brought imagination.

He was born at Almonte, Ontario, in 1867, and died at Philadelphia on April 29th.

MEDICAL NEWS

University of London

At recent examinations the following candidates were successful:—

THIRD EXAMINATION FOR M.B., B.S.

W. H. J. Baker (*b*), London; K. P. Ball (*a*), Middlesex; J. P. Bentley (*a*), Charing Cross; A. J. Bernfeld (*c*), Middlesex; I. M. Hall (*a*, *b*, *d*, and *university medal*), Univ. Coll.; L. A. Ives (*a*) and Thomas Parkinson (*c*), St. Bart.'s; and W. M. L. Turner (*c*), Univ. Coll. (all with honours). Sheila M. Anderson and Evelyn G. Ashton, Roy. Free; C. E. Aston, Univ. Coll.; A. H. Bacon, St. Bart.'s; Janet E. Bottomley, Roy. Free; C. M. Bowker, St. George's; Katharine M. H. Branson, Roy. Free; F. J. Brice, London; K. P. Brown, St. Bart.'s; J. C. McC. Browne, Univ. Coll.; Marjorie G. Bryan, Univ. Coll., Cardiff; J. A. Chamberlin, St. Thomas's; L. J. Clapham, St. Mary's; E. M. B. Clements, Univ. Coll.; J. W. C. Cochrane, St. Bart.'s; Alfred Cohen, Univ. Coll.; A. L. Collins, Westminster; Harris Cooper, London; Frances M. Cox, Roy. Free; R. V. Coxon, Guy's; W. V. Cruden, St. Bart.'s; Eleanor Davies-Jones, Roy. Free; E. C. Dax and John de Swiet, St. Mary's; Nancy K. Dick, Roy. Free; J. H. Dobree, St. Bart.'s; E. G. Dolton, St. Thomas's; Cecile R. Doniger, Univ. Coll.; J. J. Dubash, St. Bart.'s; Gertrude L. E. Dudderidge, Roy. Free; Avis M. Dyer and D. F. Eastcott, Univ. Coll.; G. F. Edwards, Charing Cross; T. K. Elliott, St. Mary's; Winifred M. Emmett, Roy. Free; P. G. Epps, Guy's; G. A. Fairlie-Clarke, St. Bart.'s; D. W. Fell, St. Mary's; W. B. Foster, St. Bart.'s; Audrey U. Fraser, Roy. Free; E. D. B. Freedman, Westminster; A. S. Garrett, King's Coll.; Edith Gilchrist, Roy. Free; B. F. B. Gulliver, Univ. Coll.; H. E. Hobbs, London; M. A. Imray, Guy's; J. G. H. Ince and Stella M. Instone, Univ. Coll.; Harry Jackson, St. Bart.'s; Spencer Jackson, St. Thomas's; Ursula James, Roy. Free; Erwin Japha, Middlesex; T. H. Jenkins, Univ. Coll.; R. C. Jenkinson, Westminster; P. H. Jobson, King's Coll.; E. C. Jones, St. Bart.'s; G. B. Jones, Univ. Coll.; J. M. Jones, King's Coll.; J. H. H. Keall, St. George's; H. A. Kelsey, London; J. W. L. Kemp, St. Bart.'s; B. W. Lacey, Middlesex; L. P. Lassman, London; J. D. Laycock, St. Thomas's; J. A. Lewis, St. George's; B. G. A. Lilwall, Guy's; E. L. Loewenthal, Univ. Coll.; W. H. McDonald, London; Norma M. MacLeod, King's Coll.; Constance A. Mallett, Univ. Brist.; A. D. Messent, St. Bart.'s; Agnes M. D. Milne, Roy. Free; D. N. B. Morgan, Middlesex; D. W. Moynagh, St. Bart.'s; G. M. Müller, Ceylon Med. Coll. and King's Coll.; F. L. E. Musgrove, Guy's; W. M. Owen, St. Thomas's; Eileen B. Palmer, Roy. Free; W. M. Philip, Guy's; Frances J. Pounds, Roy. Free; K. W. Powell, St. Thomas's; K. J. Powell, Univ. Coll.; R. E. A. Price, London; Dorothy M. Pritchard, Roy. Free; S. H. Raza, Guy's; E. G. Reynolds, St. Bart.'s; Ranyl Rhydwen, Guy's; Gwen Richards, Roy. Free; H. J. Richards, Univ. Coll.; Mary C. Rowe, Roy. Free; S. T. Rutherford, St. Bart.'s; J. M. Smiles, Univ. Coll.; D. J. N. Smith, Charing Cross; Kenelm Smith, London; F. E. Stock, King's Coll.; Alizon F. Stookes, Roy. Free; B. D. Stutter, Middlesex; N. G. G. Talbot, King's Coll.; K. H. Taylor, St. Thomas's; I. E. J. Thomas, Guy's; Peter Tomlinson, St. Thomas's; Eileen W. Town, Roy. Free; G. C. Tresidder, London; Ivy M. Tuck and D. M. Wallace, Univ. Coll.; H. P. Watts, Westminster; J. C. Watts, St. Thomas's; Aileen E. M. Whetnall and D. I. Williams, King's Coll.; T. G. Williams, Middlesex; A. D. Willis, Guy's; and A. R. Wood, St. Thomas's.

(*a*) Distinguished in medicine; (*b*) distinguished in pathology; (*c*) distinguished in forensic medicine and hygiene; (*d*) distinguished in surgery.

The following students have passed in one of the two groups of subjects:—

Group I.—B. S. S. Acharya, J. D. F. Armstrong, E. A. Atkinson, Romana G. Bartelot, C. A. Bathfield, K. M. Bhansali, W. E. W. Bridger, A. A. G. Clarke, J. C. A. L. Colenbrander, J. H. L. Conway-Hughes, A. H. Cutting, A. P. Dale-Bussell, A. S. Dods, A. M. Edwards, J. A. P. Evans, R. W. Evans, C. G. Fagg, Wilfred Fine, Henry Foster, Ysobel M. Garland, Sangad Garnjana-Goonchorn, G. N. L. Godber, L. J. Grant, L. A. T. Hamilton, S. R. T. Headley, R. N. Herson, C. W. Horncastle, N. C. Horne, S. T. H. Jenkins, C. C. Kirby, R. P. Lawson, C. V. Lewis, Eluned M. Lloyd-Davies, Sidney Locket, V. D. Logue, M. C. W. Long, Elizabeth C. Marshall, I. J. Mathias, P. S. Meyrick, G. S. Moore, J. N. M. Parry, K. G. Pascall, Nancy Perry, Gloria H. Platt, A. B. Pollard, Nancy E. Robbins, Margaret D. Snelling, C. J. Stewart, R. L. Thompson, D. C. Tomlins, P. E. R. B. Unwin, F. H. Vieyra, Betty Walker, M. H. G. White, R. A. White, R. J. Whiting, and Nona E. Wright.

Group II.—W. E. Clarke, Dorothy L. Crossley, D. G. Evans, E. O. Evans, C. C. Evill, D. S. Foster, Max Halberstaedter, Violet E. N. Harris, Mary C. Hopper, Doreen Jamieson, P. H. Jayes, Ruth Jones, Guanbee Kruatrachue, R. J. H. McMahon, S. W. Maxwell, M. T. Read, H. M. Rice, K. S. Richard, R. B. K. Rickford, D. K. Sambrook, J. R. Simpson, D. A. Skan, G. R. Staley, K. B. Thornton, J. W. Warrick, W. R. W. West-Watson, and R. F. Wyatt.

PH.D.

Freddy Himmelweit, St. Mary's (bacteriology); and Paul Pincus, Roy. Dental (dental pathology).

University of Manchester

Prof. A. D. Macdonald has been appointed to succeed Prof. H. B. Maitland as dean of the medical school of the university. Dr. Raymond Whitehead, lecturer in pathology, has been elected to a Rockefeller fellowship and has been granted leave of absence for the session 1938–39. He will work at the school of medicine and dentistry of the University of Rochester, New York.

University of Wales

At recent examinations the following candidates were successful in obtaining the tuberculosis diseases diploma:—

H. L. Ackerman, Ali Azmy, V. N. Krishna Iyer, H. S. Lohgarh, Sailendrakumar Sen, A. A. R. Soliman, W. D. Sulakhe, J. H. Vanarase, and Raman Viswanathan.

University of Edinburgh

Prof. B. P. Babkin, who holds the chair of physiology at the McGill University, Montreal, will lecture at the University on June 21st and 23rd at 5 P.M. He will speak on the regulation of the secretory activity of the gastric glands, and on the significance of conditioned reflexes in the light of recent work. Students and graduates are invited to attend.

Leishman Memorial Prize

Lieut.-Colonel E. V. Whitby has been awarded this prize for 1937. The prize is awarded annually to an officer of the Royal Army Medical Corps or the Army Dental Corps for work of outstanding merit.

Oxford Ophthalmological Congress

This congress will be held at Keble College from July 7th to 9th. After an address of welcome by the master, Mr. C. G. Russ Wood, Prof. Hugh Cairns (Oxford), and Dr. Bernard Chavasse (Liverpool) will open a discussion on ocular palsies, their ætiology, diagnosis, and treatment. Mr. F. A. Williamson-Noble (London) will read a paper on contact glasses considered from the clinical standpoint with a survey of results obtained. In the afternoon Dr. J. A. van Heuven (Utrecht) will speak on papillœdema and Dr. Czukràsz Ida (Debrecen) will describe Hungarian plastic methods, particularly the technique employed by Prof. Blaskovics and Prof. Kreiker. On July 8th papers will be read by Mr. Harrison Butler (Birmingham) on capsular glaucoma and by Mr. Frederick Ridley (London) on an "active" substance in the tears. Prof. A. von Szily, formerly director of the University Eye Clinic at Münster, will deliver the Doyne memorial lecture. He has chosen as his subject the contribution of pathological examinations to the elucidation of the problems of cataract. At the afternoon session Prof. Hans Lauber (Warsaw) will speak on the relationship between intracranial and retinal blood pressure and intra-ocular tension and the treatment of tabetic optic atrophy, and Dr. H. M. Traquair (Edinburgh) will open a discussion on anæsthesia in ophthalmic surgery. Mr. J. Cole Marshall (London) will show a film illustrating the operation for detachment of the retina by diathermy and electrolysis. After the annual general meeting on July 9th papers will be read by Mr. P. H. Adams (Oxford), Dr. Bernard Samuels (New York), and Dr. Robert Buxton (Weston-super-Mare). Further information may be had from the hon. secretary, Dr. F. A. Anderson, 12, St. John's-hill, Shrewsbury.

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Royal Free Hospital

On Wednesday, June 15th at 3 P.M., Dame Florence Barrie Lambert will present the prizes and certificates to the students of the London School of Medicine for Women.

Disposal of the Dead

The National Association of Cemetery and Crematorium Superintendents and the Federation of Cremation Authorities in Great Britain will hold their joint conference in Edinburgh from June 27th to 30th. Dr. W. G. Clark will speak on cremation from the public health standpoint and Dr. D. J. A. Kerr will discuss the Cremation Act and regulations and make some suggestions for their amendment. Further information may be had from Mr. Halvor Piggott, 37, York-street, Manchester, 1.

Medical Diary

June 13th to June 19th

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

THURSDAY.

Dermatology. 5 P.M. (cases at 4 P.M.), Dr. J. E. M. Wigley: (1) Premycosic Erythrodermia. Dr. H. W. Barber: (2) Hæmochromatosis in a Woman. Dr. H. Semon: (3) Sarcomatosis Cutis. (4) Yellowish Discoloration of the Finger and Toe-nails. (5) Colloid Milium.

FRIDAY.

Obstetrics and Gynæcology. 8 P.M., Mr. S Gordon Luker: A Mesenteric Cyst Simulating an Ovarian Tumour. Dame Louise McIlroy: Obstetric Shock. Prof. H. L. Sheehan will also speak.

SATURDAY.

Orthopædics. 2.30 P.M., visit to Queen Mary's Hospital, Carshalton.

Disease in Children. 3 P.M., visit to Caterham Hospital. The following patients will be demonstrated by the staff: (1) Dystrophia Myotonica in a Child; (2) Double Hemiplegia; (3) ? Parathyroid Epilepsy; (4) ? Cerebral Diplegia of Unusual Type; (5–6) Microcephaly and Nanocephaly; (7) Epiloia; (8) Choreo-athetosis; (9) Mongolism. Histological specimens from the brains of mongols will be demonstrated.

PADDINGTON MEDICAL SOCIETY.

TUESDAY.—9 P.M. (Paddington Tuberculosis Dispensary, 20, Talbot-road, W.), Dr. S. Crown: The Rôle of the Local Medical Society. (Presidential address.)

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

UNIVERSITY OF LONDON.

TUESDAY.—5 P.M. (University College, Gower-street, W.C.), Prof. C. H. Best, F.R.S. (Toronto): Heparin and Thrombosis.

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane-road, W.

TUESDAY.—4.30 P.M., Dr. H. Gardiner-Hill: Diseases of the Ductless Glands.

WEDNESDAY.—Noon, clinical and pathological conference (medical). 2 P.M., Mr. G. A. D. Haslewood, D.Sc.: The Chemical Estimation and Detection of Certain Common Poisons. 3 P.M., clinical and pathological conference (surgical). 4.30 P.M., Prof. J. C. Drummond, D.Sc.: Practical Aspects of Modern Vitamin Research.

THURSDAY.—2.15 P.M., Dr. Duncan White: radiological demonstration.

FRIDAY.—2 P.M., clinical and pathological conference (obstetrics and gynæcology). 4.30 P.M., Dr. Gardiner-Hill: Diseases of the Ductless Glands.

Daily, 10 A.M. to 4 P.M., medical clinics, surgical clinics and operations, obstetrical and gynæcological clinics and operations.

ST. MARY'S HOSPITAL, W.

TUESDAY.—5 P.M. (Institute of Pathology and Research), Sir John Fraser: Surgery and Circulatory Disease.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL, S.W.

MONDAY.—5 P.M., Sir Frederick Hobday: Comparative Medicine.

THURSDAY.—5 P.M., Dr. A. J. Lewis: psychiatric demonstration.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.

THURSDAY.—2 P.M., Dr. W. W. Payne: Some Useful Tests of Renal Function. 3 P.M., Mr. J. H. Doggart: Diseases of the Cornea and Conjunctiva in Children.

Out-patient clinics daily at 10 A.M. and ward visits at 2 P.M.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY to SUNDAY.—ST. PETER'S HOSPITAL, Henrietta-street, W.C., all-day course in urology.—WEST END HOSPITAL FOR NERVOUS DISEASES, Welbeck-street, W., afternoon course in neurology.—ROYAL CANCER HOSPITAL, Fulham-road, S.W., Sat. and Sun., course in radiology.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION.

WEDNESDAY.—Visit to Allen and Hanburys Works, Ware.

Appointments

BINGEMAN, ILMA, B.S., M.B. Lond., D.P.H., Assistant Medical Officer for Maternity and Child Welfare Work for Nottingham.

BOMFORD, R. R., B.M. Oxon., M.R.C.P. Lond., Hon. Assistant Physician to the London Hospital.

CAIRNS H. W. B., M.B. Adelaide, F.R.C.S. Eng., Consulting Surgeon to the Department of Neurosurgery at the London Hospital.

CROOK, H. W. D., M.R.C.S. Eng., D.P.M., Second Assistant Medical Officer at Knowle Mental Hospital, Fareham.

CULLEN, BARTHOLOMEW, M.B., L.M., Resident Medical Officer at Nottingham City Hospital.

DEVLIN, WILHELMINA L., M.B. Belf., D.P.H., Assistant Medical Officer of Health and Assistant School Medical Officer for Blackburn.

FAIRBROTHER, R. W., M.D. Manch., M.R.C.P. Lond., Director of the Clinical Laboratory at Manchester Royal Infirmary.

GOUREVITCH, ARNOLD, M.R.C.S. Eng., Resident Surgical Registrar at the Queen's Hospital, Birmingham.

HARDWICK, S. W., M.D., M.R.C.P. Lond., D.P.M., Deputy Medical Superintendent at West Park Hospital (L.C.C.).

HART, E. W., M.B. Camb., House Physician at the Hospital for Sick Children, Great Ormond-street.

HESLOP, T. STEWART, M.B. Manch., F.R.C.S. Eng., Chief Assistant to the Surgical Unit at Manchester Royal Infirmary.

MCGILL, A. F., M.D., M.S., Assistant Resident Surgical Officer at Nottingham City Hospital.

O'DONNELL, M. J., M.R.C.S. Eng., L.D.S., Assistant Consulting Dental Surgeon in the Dental Service of the London County Council.

SIMPSON, WILLIAM, M.D. Edin., D.P.H., Hon. Assistant Physician to the Royal Infirmary, Preston.

SLATER, E. T. O., M.B. Camb., M.R.C.P. Lond., D.P.M., First Assistant Medical Officer at the Maudsley Hospital.

SMART, JOSEPH, M.D. Camb., M.R.C.P. Lond., Medical Registrar at the London Chest Hospital.

THOMPSON, V. C., M.B. Lond., F.R.C.S. Eng., Surgical Registrar at the London Chest Hospital.

WHEELER, F. E., F.R.C.S., Resident Surgical Officer at the Prince of Wales's Hospital, Plymouth.

YARROW, D. E., L.R.C.P. Lond., House Physician at the Hospital for Sick Children, Great Ormond-street.

Withington Hospital, Manchester.—The following have been recommended for appointment to the staff of the hospital:—

EMBLIN, J. N. I., M.B., F.R.C.S. Edin., Resident Obstetrical Officer;

AINSCOW, C. B., M.B. Manch., Assistant Resident Obstetrical Officer; and

OWEN, E. T., M.B. Liverp., Assistant Resident Surgical Officer.

Colonial Medical Service.—The following appointments, promotions, and transfers are announced:—

CLARKE, P. E. M., M.B. Belf., Medical Officer, British Honduras;

GLYNN, W. A., M.R.C.S. Eng., Medical Officer, Nyasaland;

SKELTON-BROWNE, N. H., B.Sc., L.R.C.P. Lond., Medical Officer, Gibraltar;

HUGHES, WILLIAM, M.D. N.U.I., M.R.C.P. Lond., Medical Officer, Nigeria;

WASE-BAILEY, B. N. V., M.D. Edin., D.P.H., D.T.M. & H., Chief Medical Officer, Barbados;

SAMUELS, W. F., L.M. Dubl., Medical Superintendent, St. Ann's Mental Hospital, Trinidad (temporary appointment); and

CLEARKIN, P. A., M.D. Belf., D.P.H., Bacteriologist and Pathologist, British Guiana (temporary appointment).

Vacancies

For further information refer to the advertisement columns

Aberdeen Royal Mental Hosp.—Asst. Phys., £400.

Albert Dock Hosp., E.—Res. Surg. O. for Fracture Clinic, £250.

Aylesbury, Royal Buckinghamshire Hosp.—Jun. Res. M.O., at rate of £150.

Barnsley, Beckett Hosp. and Dispensary.—Jun. H.S., £150.

Battersea General Hosp., S.W.—H.P. and H.S., each £130.

Birmingham City.—M.O. for Casualty Service, £500.

Birmingham City, Maternity and Child Welfare Dept.—Temp. M.O., £10 weekly.

Birmingham, Dudley-road Hosp.—Physician, £650.

Birmingham United Hosp.—Psychologist for Nerve Hosp., £500.

Birmingham and Midland Eye Hosp.—H.S., at rate of £130.

Bolingbroke Hosp., Wandsworth Common, S.W.—Cas. O., at rate of £120. Also Hon. Physician.

Bolton Royal Infirmary.—Asst. Res. Surg. O., £200. Also two H.S.'s, each £150.

Bradford Royal Infirmary.—Asst. Radium Officer, £175.

Brighton Royal Sussex County Hosp.—Cas. H.S., £120.

Bristol Royal Infirmary, &c.—Hon. Asst. Surgeon to Joint Fracture Dept.

Bristol University.—Professorship of Pathology, £1000. Also Lecturer in Pathology, £400–£500.

Burton-on-Trent General Infirmary.—Cas. O. and H.P., £150.

Cambridge, Addenbrooke's Hosp.—Asst. Radiologist, at rate of £500.

Canterbury, Kent and Canterbury Hosp.—H.S. to Spec. Depts., at rate of £125.

Canterbury and Folkestone Hosps.—Director of Pathology, £600.

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Cape Town University.—Chair of Physiology, £1000.
Central Middlesex County Hosp., Acton-lane, N.W.—Res. Asst. M.O., £400.
Chartered Society of Massage, &c., Tavistock-square.—Editor, £200.
Colchester, Essex County Hosp.—Asst. H.S., £120.
Connaught Hosp., Walthamstow, E.—Sen. Res. Surg. O. and Cas. O., at rate of £200 and £110 respectively.
Derbyshire County Council.—Asst. County M.O.H., £700.
Dewsbury and District General Infirmary.—Sen. H.S. and Second H.S., £200 and £150 respectively.
Doncaster Royal Infirmary.—Cas. H.S., at rate of £150.
Dreadnought Hosp., Greenwich, S.E.—Receiving Room Officer, at rate of £150.
Durham County and Sunderland Eye Infirmary.—H.S., £350.
East Ham Memorial Hosp., Shrewsbury-road, E.—H.S. to Spec. Depts. and Cas. O., at rate of £120.
Elizabeth Garrett Anderson Hosp., Euston-road, N.W.—H.P., H.S.'s, and Obstet. Asst., each at rate of £50.
Exeter, Royal Devon and Exeter Hosp.—Res. Surg. O., £250.
General Lying-in Hosp., York-road, Lambeth, S.E.—Jun. Res. M.O., &c., at rate of £100.
Glasgow, Victoria Infirmary.—Radiologist, £800.
Gloucestershire Royal Infirmary.—H.P. and two H.S.'s, each at rate of £150.
Halifax Royal Infirmary.—Res. Surg. O., £250. Also H.P., £175.
Hampstead General Hosp., Haverstock-hill.—H.S. at rate of £100.
Hastings, Royal East Sussex Hosp.—Sen. H.S., at rate of £200.
Holland (Lincolnshire) County Council.—Asst. M.O.H., £600.
Hosp. or Consumption and Diseases of the Chest, Brompton, S.W.—Med. Reg., £150.
Hosp. of St. John and St. Elizabeth, 60, Grove End-road, N.W.—Res. H.P., at rate of £100.
Huddersfield Royal Infirmary.—H.S., at rate of £150.
Ilford, King George Hosp.—H.S., at rate of £100. Also two Hon. Asst. Physicians and Hon. Psychologist.
Indian Medical Service.—Commissions.
Ipswich, East Suffolk and Ipswich Hosp.—H.S. to Orthopædic and Fracture Dept., £144.
Lancashire County Council.—Asst. County M.O., £800.
Leamington Spa, Warneford General Hosp.—Sen. Res. Surg. O., £200.
Liverpool Hosp. for Consumption and Diseases of the Chest.—Res. M.O., £150.
London County Council.—Asst. M.O.'s (Grade II), £250.
London Homœopathic Hosp., Gt. Ormond-street, W.C.—H.S. and Gynæcological H.S., each at rate of £100.
London Hosp., E.—Anæsthetist to Dental Dept., £25.
Maidstone, Kent County Ophthalmic and Aural Hosp.—Ophth. H.S., at rate of £200.
Manchester, County Mental Hosp., Prestwich.—Deputy Med. Supt., £750.
Manchester Royal Children's Hosp., Pendlebury.—Asst. M.O. to Out-patients' Dept., at rate of £150.
Manchester Royal Infirmary.—Res. Jun. M.O. for Barnes Convalescent Hosp., at rate of £150. Also Asst. M.O. to Dermatological Dept., £35.
Manchester, St. Mary's Hosps.—Asst. Res. Obstet. O., £100.
Melton, Suffolk, St. Audry's Hosp. for Mental Diseases.—Jun. Asst. M.O., £350.
Metropolitan Hosp., E.—Surgeon.
Middlesbrough County Borough.—Asst. M.O.H., &c., £350.
Middlesbrough, North Riding Infirmary.—Sen. H.S., £175. Also Third H.S., at rate of £140.
National Temperance Hosp., Hampstead-road, N.W.—H.P., at rate of £100.
Newcastle-upon-Tyne City and County.—Sen. Child Welfare Officer, £750.
Newcastle-upon-Tyne Eye Hosp.—Hon. Ophth. Surgeon.
Newcastle-upon-Tyne, Royal Victoria Infirmary. — Resident appointments, £200, £100, and £50 respectively. Also two Med. Regs., £250.
Northampton General Hosp.—Res. Anæsthetist, at rate of £150.
Nottingham General Hosp.—Res. Cas O., at rate of £150.
Oldham Royal Infirmary.—Sen. H.S., at rate of £250–£300. Also two H.S.'s, each at rate of £175.
Plymouth, Mount Gold Orthopædic and Pulmonary Tuberculosis Hosp.—Res. M.O., £300.
Preston and County of Lancaster Queen Victoria Royal Infirmary. H.P., at rate of £150.
Public Schools Exploring Society.—Hon. Surgeon
Queen's Hosp. for Children, Hackney-road, E.—Ophth. Surgeon.
Rainhill, Lancs, County Mental Hosp.—Asst. M.O., £550.
Redhill County Hosp., Edgware.—Jun. Res. Asst. M.O., at rate of £250.
Rotherham Hosp.—Cas. H.S., £150.
Royal Naval Medical Service.—M.O.'s.
Royal Northern Hosp., Holloway, N.—Ophth. Reg., £50.
Royal Waterloo Hosp. for Children and Women, Waterloo-road, S.E.—Hon. Clin. Asst. at Rheumatism Centre.
St. John's Hosp., Lewisham, S.E.—H.S., at rate of £100.
Salford, Hope Hosp.—Res. Obstet. O., £400.
Salford Royal Hosp.—H.S., at rate of £125.
Shoreham-by-Sea, Southlands Hosp.—Asst Res. M.O., £300.
Storthes Hall Mental Hosp., Kirkburton, near Huddersfield.—Med. Supt., £1000.
Sudan Medical Service.—Vacancy, £E720.
Sunderland Royal Infirmary.—H.P., and Cas. O. and H.S. to Ear, Nose, and Throat Dept., each £120.
Sutton and Cheam Hosp.—Jun. Res. M.O., at rate of £100.
Taunton and Somerset Hosp.—H.P. and H.S., each £125.
Wakefield, Clayton Hosp.—H.S., at rate of £200.
Warneford Hosp., Oxford.—Physician Supt., £1000.
Watford and District Peace Memorial Hosp.—H.S. and H.P., each at rate of £150.
West London Hosp., Hammersmith, W.—Two Cas. O.'s, each £250. Also H.P. and two H.S.'s, each at rate of £100.
Weston-super-Mare Hosp.—Res. H.P., £150.
Willesden General Hosp., Harlesden-road, N.W.—Cas. O., at rate of £100.
Wolverhampton Education Committee.—Asst. M.O., £600.
Wolverhampton Royal Hosp.—Res. Anæsthetist, at rate of £200. Also H.S. and H.P., each at rate of £100.
Wood Green and Southgate Hosp., Bounds Green-road, N.—Second Hon. Gynæcological Surgeon.
York County Hosp.—Res. Anæsthetist, &c., £150.
York Dispensary.—Two Res. M.O.'s, each £175.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Bath (Somerset) and Galgate (Lancashire).

Births, Marriages, and Deaths

BIRTHS

BALL.—On May 29th, the wife of Dr. G. D. J. Ball, of Plymouth—a son.
DEWEY.—On June 3rd, the wife of Dr. T. S. Dewey, of Tonbridge—two daughters.
GALLOP.—On June 6th, at Vincent-square, S.W., the wife of Dr. Edward Gallop—a son.
LIVINGSTONE.—On June 4th, at Devonshire-place, W., the wife of Dr. James L. Livingstone, of Greville-place, St. John's Wood, N.W.—a son.
MONKHOUSE.—On June 2nd, at Theydon Bois, the wife of Dr. Eric Monkhouse—a son.
O'DONOVAN.—On June 2nd, at Nottingham, the wife of Dr. P. H. O'Donovan—a son.
SAUNDERS.—On May 23rd, at Barnstaple, the wife of Mr. K. G. W. Saunders, F.R.C.S.—a son.
TILLMAN—On June 6th, at Cromwell-road, S.W., the wife of Dr. John Tillman, Edinburgh and British Somaliland—a daughter.
WALTHER.—On May 21st, at Farnham, the wife of Dr. W. W. Walther—a daughter.

DEATHS

CHAMBERS.—On June 7th, at Roehampton, James Chambers, M.D., M.Ch. R.U.I., aged 79.
GRIFFITH.—On June 4th, at Bath, Evan Williams Griffith, M.R.C.S. Eng.
GUILDING.—On June 1st, at Reading, Lansdown Murray Guilding, B.M. Oxon., M.R.C.S. Eng., aged 79.
HALL.—On June 7th, at Lower Hellesdon, Norwich, Charlton Robert Frederick Hall, M.A., B.Chir. Camb., M.R.C.S. Eng., Medical Superintendent of Hellesdon Hospital, aged 60.
NELLEN.—On June 6th, at Hove, George Marshall Frederick Nellen, M.R.C.S. Eng., formerly of the Union-Castle Mail Steamship Company.
STACK.—On June 2nd, in London, Maurice Tancred Stack, M.B. Glasg., of Liverpool.
STEEN.—On May 31st, at Ilford, Essex, Wilfred Alexander Steen, M.R.C.S. Eng.
WINGRAVE.—On June 1st, at Lyme Regis, Vitruvius Harold Wyatt Wingrave, M.D. Durh., aged 80.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED MAY 28TH, 1938

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 2048; diphtheria, 1002; enteric fever, 17 (30 "expected"); pneumonia (primary or influenzal), 1082; puerperal pyrexia, 180; cerebro-spinal fever, 26; acute poliomyelitis, 5; encephalitis lethargica, 3; dysentery, 50; ophthalmia neonatorum, 102. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on June 3rd was 4243, which included: Scarlet fever, 824; diphtheria, 1012 (carriers, 49); measles, 1171; whooping-cough, 259; puerperal fever, 20 mothers (plus 10 babies); encephalitis lethargica, 282; poliomyelitis, 2. At St. Margaret's Hospital there were 31 babies (plus 16 mothers) with ophthalmia neonatorum.

Deaths.—In 126 great towns, including London, there was no death from small-pox or enteric fever, 16 (6) from measles, 3 (1) from scarlet fever, 11 (3) from whooping-cough, 29 (5) from diphtheria, 31 (9) from diarrhœa and enteritis under two years, and 39 (9) from influenza. The figures in parentheses are those for London itself.

One fatal case of measles was reported from each of 10 great towns. Diphtheria was fatal in 20 great towns, Bristol reporting 3. Influenza was credited with 5 deaths at Hull.

The number of stillbirths notified during the week was 291 (corresponding to a rate of 40 per 1000 total births), including 44 in London.

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NOTES, COMMENTS, AND ABSTRACTS

PLANTS IN RELATION TO THE HUMAN ENVIRONMENT

Extracts from a Chadwick lecture given on June 9th at the Chelsea Physic Garden by

Prof. E. J. SALISBURY, F.R.S.

ALL of us and all the lower animals depend upon green plants either directly or indirectly for our energy supply. We either have our food second-hand as when we eat a herbivorous animal such as a cow, or even more indirectly if we eat the flesh of a carnivorous animal; or we obtain our food first-hand from the plant as when we eat bread or a banana. But our ideas of food and food values have been revolutionised during the past two decades. The old idea that our needs are satisfied by a certain number of calories soon gave place to a recognition of the need for a properly balanced diet. More recent years have revealed the presence of the vitamins which though found in such small amounts play so fundamental a rôle in the proper nutrition of our bodies. The diversity of these accessory food substances and their varying degree of development even in different varieties of the same species or in different parts of the same organ have placed a new emphasis upon the nature of the food we eat. Indeed with respect to those members of the alphabet of vitamins that can be artificially prepared there is even a risk that the notion "because a little is good a lot is better" may lead to another lack of balance.

MICRO-NUTRIENTS

Quite recently our attention has been drawn to the necessity for healthy plant growth of the so-called micro-nutrients. The need of minute traces of boron for the growth of sugar-beet, the need of zinc for the healthy growth of the grape fruit, of minute traces of copper, manganese, and iron for many plants, are but a few of the instances of essential micro-nutrients that have been demonstrated. Indeed some evidence has been furnished to show that a large number of the rarer metals present in most though by no means all soils are, in extremely minute quantities, actually beneficial to plant growth. The plant not only absorbs these substances but often accumulates them in its body so that the quantity in the plant may be much greater than that in the soil itself. An instance of this is afforded by the remarkable accumulation of thallium salts in certain American species of astragalus resulting in these plants acquiring a very poisonous character with fatal results to browsing animals.

Transferred from the soil to the plant these micro-nutrients may have an important influence upon the nutritive value of the plant material not merely for animals but for man himself. This has been spectacularly demonstrated for sheep in Australia where it has been shown that the fatal disease known as staggers is due to deficiency of cobalt in the herbage which in turn is an outcome of a deficiency in the soil. So too the coast disease of sheep fed on the calcareous dune pastures appears to be due to a combination of deficiencies in respect to both cobalt and copper. What applies in so startling a manner to cobalt deficiency in sheep may well obtain in greater or less degree with regard to some of the micro-nutrients required by man and a more meticulous examination of the staples of diet is necessary before we can rightly assess their value, not so much perhaps for the mere maintenance of life but for the support of vigorous health.

GASEOUS ENVIRONMENT

The general effect of plants on our surrounding circumstances is naturally an outcome of the main changes which their mass effect produces on the environment. The different behaviour of plants and animals with respect to their relative influence upon their gaseous environment has at times been exaggerated, at others minimised. Animals from their motile habits utilise a very large amount of energy and, in consequence, one of the pronounced effects of their presence upon the atmosphere around is to increase the content of carbon dioxide as an outcome of their high rate of respiration. The organic food which the animal consumes is almost entirely utilised in the production of energy to drive the machinery of its body and this food is oxidised with the liberation of a considerable volume of carbon dioxide. Green plants on the other hand being sedentary organisms consume far less energy in respiration, but from their possession of the mixture of green pigments which we term chlorophyll, are able to absorb the external energy provided by light and so to utilise a large volume of carbon dioxide which is built up into complex carbohydrates with the simultaneous liberation of oxygen in an amount approximately equivalent to that of the carbon dioxide absorbed.

It was a too facile generalisation of these facts that led the examination candidate to conclude that if a rabbit and a cabbage were placed together in an hermetically sealed chamber they would live for ever, but the reciprocal influence of plants and animals upon the gaseous content of the atmosphere around them is a feature of great significance in the economy of nature, for this relationship of their gaseous exchanges ensures that these gases, if one may employ a financial simile, are maintained in current circulation and not accumulated in a deposit account.

A plant in full sunshine is actively respiring as well as manufacturing food and it is therefore utilising oxygen and producing carbon dioxide in the one process at the same time that it is also using carbon dioxide and producing oxygen in the other. The total effect of the plant on the gases around is hence the balance between these two processes. During the daytime and in the open the green plant may easily be producing oxygen and taking in carbon dioxide at twice the rate at which the reverse processes are proceeding. We might perhaps therefore expect that, in a dense growth of vegetation such as a woodland or a well-stocked garden, the atmosphere would exhibit an enrichment of the oxygen content. Actually however there is little if any change in composition, since the multitudinous micro-organisms in the soil itself are producing carbon dioxide in their respiration which often more than counterbalances the absorption of this gas by the green plant. Indeed the carbon-dioxide content of the air in a dense beech-wood when there is no wind may actually be appreciably in excess of the 0·03 per cent. normally present. Numerous determinations have however shown that despite the factors tending towards disparity the composition of the atmospheric air in various localities is remarkably constant.

PLANTS IN LIVING ROOMS

At one time there was some controversy over the influence of plants and particularly of flowers in living rooms. To appreciate the position it must be realised that the capacity of the green plant to make food at a faster rate than it is consumed in respiration is usually dependent upon the light intensity. Now owing to the compensatory action of our eyes in dull light we are led to imagine the intensity of illumination in a living room is much higher than it actually is. In a living room or bedroom the light intensity is often not more than one-fiftieth of that in the open, although it is of course lighter nearer the window and darker as we recede from it. It may thus easily be the case that even during the daytime on a bright day a green plant in a living room is barely receiving enough radiant energy to enable it to manufacture food fast enough to keep pace with the losses due to the utilisation of this food during respiration. In other words, there will be little or no

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increase of oxygen in the air, and little or no decrease of CO_2. There is a light intensity at which the building-up processes and the breaking-down processes just balance, known as the compensation point, and experiments have shown that this intensity varies considerably between different plants. It is very low for the aspidistra, which is the reason why this plant will flourish even in the gloom of an apartment window. With non-green parts of plants (which includes the flowers, except for their sepals and stalks) there is of course respiration but no photosynthesis, so that these increase the CO_2-content of the air and diminish the oxygen-content, the more so that the rate of respiration of floral organs is often twice that of leaves and may be very much higher. Modern physiological research has shown that a slight increase of the CO_2-content of the air may promote deep breathing, and so the old belief that it is desirable to remove plants from a sick-room after dusk might seem to be theoretically justified, although it is very doubtful whether their influence is sufficiently marked to be significant. The slight increase of humidity they bring about might even be beneficial.

INFLUENCE ON HUMIDITY

The surface of the leaves is continually giving off water vapour and when plants are growing in the mass the amount of water emitted in this way is very considerable. It has for example been calculated that a beech-wood during the course of a single season gives off water vapour equivalent to about 8½ inches of rain. The loss from an oak-wood is probably rather less, being of the order of about 5 inches. Vegetation thus plays a not inconsiderable part in maintaining the humidity of the atmosphere. Periods of drought are deleterious to health probably both from the direct effects of low humidity and from the indirect consequences, such as the prevalence of dust. Plants lose more water when the air is dry than when it is moist, hence the presence of vegetation tends to minimise the risk of the extreme aridity of the atmosphere which would be prejudicial to health.

Of the radiant energy that falls upon the surface of the foliage, and which in its absence would contribute to the heating of the soil surface and the supernatant air, more than 50 per cent. is probably utilised in evaporating water from the plant. Thus vegetation is seen in another rôle as a regulator of the temperature of the lower layers of air. Indeed it has been shown that the temperatures in woodlands are both lower in summer and higher in winter than in the open, whilst extremes of temperature are most marked where the soil surface is devoid of vegetation. The ancient belief that country air is beneficial may well be due to the fact that there the vegetation provides a safeguard against those extremes of low humidity and high or low temperature which often obtain in cities. At the same time vegetation tends to check abrupt changes, so that these play their full effect as stimuli without the suddenness of adjustment that mitigates their value.

CONSERVER OF WATER-SUPPLIES

The rain that falls upon the surface of the land is largely determined by physical conditions of the atmosphere beyond these islands, so that the local conditions of surface play but a minor part in respect to precipitation. But the presence or absence of vegetation and the nature of the plant covering do materially affect the fate of the rain, dew, mist, or snow that furnish our water-supplies. Of this total precipitation some evaporates directly into the air again; some is held by the soil as by a sponge; and some passes through or over the soil to find its way into the rivers and ultimately into the oceans to repeat the circuit of its transport. The greater the amount which is retained by the soil the less will flow down the surface and so there will be a diminution of erosion. The more sponge-like the soil the slower will be the drainage and so the water that falls at a given time may take weeks or months to find its way into the streams. It has for instance been shown that the flow of the Hertfordshire Bourne is determined by the rainfall more than a month previous. Anything therefore that tends to hold back the water will result in a higher average water table and a more prolonged flow. It will be a safeguard alike against flood or drought.

Such a safeguard is provided by vegetation. The most retentive component of the soil is the organic material provided by the decaying leaves, and of all types of vegetation which provide a copious and continually renewed supply of humus none is more effective that woodland. Rather less efficacious is grass land. Cultivated crops still less so, and bare soil least effective of all. The disastrous floods in the south of France which resulted from the extensive felling of forests in hilly country has been surpassed by those in the United States. The absence of the natural regulators of water-supply permit the incident rain to make its way unhindered to the rivers, but this same loss of water brings in its train excessive erosion. With the advent of the dry season and the absence of any reservoir in the soil the floods are inevitably followed by drought and the eroded and bare surfaces are liable to further removal by the action of wind.

So we find that in America the extensive floods were but the prelude to equally disastrous droughts and to the production of the so-called dust bowl. It has been calculated that in this way an area equivalent to nearly twice that of the whole land area of Great Britain and Ireland has been more or less ruined. The droughts and floods that have been experienced of recent years in the catchment area of the Thames are the same phenomenon on a smaller scale.

Some idea of the capacity of forest soils to conserve moisture can be gained from a comparison of the proportion of rainfall retained by such a soil before and after the surface has been burned and the sponge-like humus thereby destroyed. It was found in two such instances that the retentive capacity was in this manner reduced in one locality to less than a third and in another to one-fiftieth. A close turf of grass may prevent erosion almost as effectively as woodland though the latter is more effective as a retainer of water, but land under cultivated crops is only about a tenth as effective for preventing water loss. When we consider that probably all the heather-clad moorlands of the west and north, and the heathlands of the south and east, of England were once woodland; that forests once clothed the Weald of Kent and the plains of Worcester, to mention but two areas that were well wooded until comparatively recent times; we realise that if conditions are not worse than they actually are it is due to luck rather than to judgment. The need for insurance against a national emergency in respect to timber has dictated our too long delayed policy of national afforestation, but we may well ask whether this should not be combined with one directed towards the maintenance of healthy conditions.

THE HORSE-SHOE CLUB

IN 1930 began an exchange of house physicians between the Children's Hospital and the General Hospital, St. Louis, and the East London Hospital for Children (now the Princess Elizabeth of York Hospital for Children). To commemorate this association a club, called the Horse-Shoe Club, after a game played at St. Louis, was founded, and it is now proposed that this club should be enlarged in scope. At a dinner lately held at the Langham Hotel, London, Dr. Geoffrey Bourne, who was elected chairman, suggested that there should be two branches, one in the United States of America and one in England, and that the British branch should consist, first, of medical men and women who have studied in America for at least six months; secondly, of medical men and women who grant facilities for American research workers in their departments;

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and thirdly, of non-medical men and women who give moral or other support for facilities for the above work. The objects of the club are to encourage friendship between graduates in medicine in the United States and Great Britain, to promote the establishment of exchange resident assistantships between the two countries, and to enable Americans holding appointments or engaged in research in this country to make their visit as profitable and enjoyable as possible. A dinner is to be held in London each spring, to which American colleagues and friends will be invited. Further particulars may be had from the secretary, Dr. Leonard Findlay, Princess Elizabeth of York Hospital for Children, Shadwell, London, E.1.

SEPTIC INFECTION AT POST-MORTEMS

A LEAFLET on prevention of sepsis in the post-mortem room has been issued by the Pathological Society of Great Britain and Ireland and is inserted in the current issue of the *Journal of Pathology and Bacteriology*. After pointing to the need for proper care of post-mortem gloves, the leaflet states that it is inadvisable to perform autopsies when there are recent cuts or scratches on the hands, and then passes on to the precautions to be taken if a finger is pricked during an examination. "If during an autopsy the pathologist should prick himself however slightly whether with the knife or on a jagged bone or tooth, even if he is in doubt whether he has been pricked at all, it is his duty *to stop* AT ONCE, *remove his glove and make the wound bleed* by digital compression causing congestion, by centrifugal force (swinging the arm), by sucking and by putting the hand in hot water. There should not be a minute's delay in carrying out these procedures, and the autopsy should, if possible, be completed by someone else."

Copies of the leaflet may be had from Oliver and Boyd, 98, Great Russell-street, London, or Tweeddale-court, Edinburgh, at the following rates: 50 copies post free 6*s*. 6*d*.; 100, 10*s*. 6*d*.; 250, 21*s*.

GUIDE TO LONDON VOLUNTARY HOSPITALS

WE have received a copy of the fourth edition (1938) of the Hospital Guide, being a directory and handbook to the hospitals of London, published by the advisory hospital committee of the Hospital Saving Association (30, Lancaster-gate, London, W.2, price 3*d*.). The book is a mine of useful information about the voluntary hospitals in London, both general and special, including convalescent homes in the country. Strictly speaking, it is not a complete hospital guide of London because it says nothing about the county hospital system apart from an unadorned list of the L.C.C. general and children's hospitals at which the H.S.A. green voucher is now accepted. Its value is enhanced by a series of articles setting out the nature and object of provident associations and the schemes for admission of middle-class patients to voluntary hospitals. Emphasis is laid on the ethical side of the supply of medical aids and a list is given of the firms who have accepted the standards of the Institute of British Surgical Technicians. There is also a useful article on women in relation to national health insurance.

THE DEVELOPMENT OF CHEMICAL KNOWLEDGE

A SERIES of books by different authors dealing with the development of the various branches of knowledge during the last hundred years includes one on chemistry[1] by Prof. Alexander Findlay. His aim was to trace in broad outline how chemists since the 1830's have unravelled the inner structure of the molecules of many of nature's most important compounds, and have built up these compounds in the laboratory. Prof. Findlay's gift of clear exposition is well known and he has used it here to set forth in simple language not only the main facts of the development of chemical knowledge but the application of such knowledge to industrial and other purposes. The information given in the thirteen chapters covering a diversity of fields is up to date, and the inclusion of a large number of references in footnotes makes it easy for the reader to travel farther in any direction that specially interests him. An appendix contains biographical notes of a number of famous chemists.

[1] A Hundred Years of Chemistry. By Alexander Findlay, Professor of Chemistry in the University of Aberdeen. London: Gerald Duckworth and Co. 1937. Pp. 352. 15*s*.

NEW PREPARATIONS

"A.B." BRAND PROTAMINE INSULIN (WITH ZINC) SUSPENSION is manufactured jointly by the British Drug Houses Ltd. (Graham-street, London, N.1) and Allen and Hanburys Ltd. (37, Lombard-street, E.C.3). Its advantage over ordinary insulin is that its action is more prolonged and uniform; the number of injections required is therefore less, and the control of symptoms more satisfactory, so that the total insulin dosage can often be reduced. The new preparation may be used instead of ordinary insulin, or in conjunction with it, but in emergencies where a rapid action is required (infections, acidosis, diabetic coma) ordinary insulin is needed. Protamine Insulin (with Zinc) Suspension has a *p*H of 7·1, which is approximately that of the body fluids; at this reaction the complex is least soluble and its action therefore most prolonged. It is issued in two strengths (namely, 40 units per c.cm. and 80 units per c.cm.) and the potency and sterility of each batch is certified by the Medical Research Council.

GONADYL.—This name is given by Roussel Laboratories Ltd. (36, Cavendish-square, W.1) to a gonadotropic extract prepared from the serum of pregnant mares. It is described as a pure gonadotropic active principle, predominantly follicle-stimulating, and is standardised in rat units according to its power to increase the size of the ovaries. The extract, which is a powder supplied in ampoules (with a solvent) for subcutaneous injection, is recommended for all conditions where there is reason to believe that the function of the gonads is deficient—e.g., delayed puberty, cryptorchidism, primary amenorrhœa, and azoöspermia.

From T. J. SMITH AND NEPHEW LTD. (Neptune-street, Hull) we have received copies of the eighth edition of their book, "Elastoplast Technique," and the fourth edition of their "Cellona Technique." These are available to members of the medical profession.

FARMHOUSE DIRECTORY.—In his preface to the small handbook[1] published by the Farmhouse Holiday Bureau, Mr. A. G. Street suggests that "rural holidays build a welcome bridge over the lamentable gulf of ignorance which exists between town and country." Part of the ignorance of townspeople is that they often do not know how to begin to find suitable holiday accommodation in the country, and they will welcome this list of the members of the bureau who wish to receive paying guests this summer. Their names and addresses are arranged alphabetically according to counties, and brief notes are given of the kind of holiday they offer to their visitors.

AN IODINE BUREAU.—The Nitrate Corporation of Chile Ltd. has formed an iodine educational bureau which is to collect information about iodine and place it at the disposal of medical, agricultural, and other scientific workers. It will also collaborate with scientific institutions in research. The director, from next September, will be Mr. Francis C. Kelly, Ph.D., who has for six years been deputy director of the Imperial Bureau of Animal Nutrition at the Rowett Research Institute in Aberdeen, and the offices will be at Stone House, Bishopsgate, London, E.C.2.

[1] Farmhouse and Country Holiday Handbook. 1938. Pp. 36. 6*d*. Obtainable from the Farmhouse Holiday Bureau, 11, Southampton-row, London, W.C.1.

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ADDRESSES AND ORIGINAL ARTICLES

CONTROL OF INFECTION IN CHILDREN'S WARDS

By RICHARD H. DOBBS, M.B. Camb., M.R.C.P. Lond.

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RENATUS KEMPTHORNE, B.M. Oxon., M.R.C.P. Lond.

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THE problem of infection in children's wards is often approached with trepidation because of uncertain knowledge of the principles of infection and immunity. When an outbreak occurs in a ward it is customary to isolate or to discharge the developed cases and to stop the admission of new patients until the period of quarantine is over, or until the ward has been emptied and disinfected. As this aim of bacteriological sterility involves serious disorganisation and wastage of the hospital accommodation, an attempt will be made here to consider the problem more generally from an epidemiological point of view, in the hope of simplifying the task of medical officers responsible for the admission of children to hospital and for the control of infection.

It is convenient to classify the infectious diseases into respiratory and non-respiratory groups.[27] In the former, infection is usually air-borne by droplets or by dust,[10 59]; in the latter it is conveyed by contact.[21] But it is well to remember that these methods are to a large extent alternative, and that such an obviously respiratory disease as the common cold is easily spread by remote contact in the food.[6]

CLASSIFICATION

A. *Respiratory group*, spread by droplets and by contact.

1. Short incubation period.
   (*a*) *Serious.*—Diphtheria and hæmolytic streptococcal infections including scarlet fever.
   (*b*) *Mild.*—Upper respiratory infections (e.g., common cold and influenza).
2. Long incubation period.
   (*a*) *Serious.*—Measles, whooping-cough, small-pox.
   (*b*) *Mild.*—Chicken-pox, mumps, German measles.

B. *Non-respiratory group*, spread by contact only.

(*a*) Infantile diarrhœa, typhoid, and dysentery.
(*b*) Vulvovaginitis.

In diphtheria and streptococcal infections an immune person may, as a chronic carrier of the organism, act as a focus of an epidemic, but in the other respiratory groups it can be assumed that true carriers do not exist, although for short periods the organism may be transferred in fomites or on the hands.

Diseases which are less infectious than these are not likely to cause trouble. Tuberculosis must be isolated in the open stage, and meningococcal meningitis until the nasopharyngeal cultures have been negative on three successive occasions. Poliomyelitis is rarely infectious after the first week, but as convalescents may become carriers[18] they should not be introduced into a children's ward. Pneumonia should be isolated, and although a primary case is not likely to give rise to others, secondary pneumonia may cause a serious ward epidemic.[21] Catarrhal jaundice[37] and infective hepatitis[4] will, by the subsequent rules, be isolated in the prodromal stages.

RESPIRATORY DISEASES WITH SHORT INCUBATION

Diphtheria.—The sources of infection that may be overlooked are those presenting as laryngitis and tracheobronchitis with or without stridor, as aural discharges and refractory skin wounds,[11 41] as abortive cases with little or no membrane formation, and as nasal diphtheria,[2] which is often symptomless until a late stage.

The Schick test is valuable in separating susceptibles from immunes, but the immunity is not absolute;[57] and it can be assumed that all the carriers are in the Schick-negative group. The carriers are especially those with unhealthy throats and ears, and it is important to test for virulence all organisms separated from carriers, because they must be isolated until the result of the virulence test is known.

Active immunisation of Schick-positives proves effective after a few weeks; it can be obtained[56] with modified toxin, preferably by the three-dose method with toxoid-antitoxin floccules. Passive antitoxic immunity lasting 1–3 weeks or longer can be induced with antitoxic serum. The administration of serum, however, does not control an epidemic, and Okell[45] has pointed out that it is probably better policy to withhold serum at first, and instead to separate the immunes from the non-immunes. The latter should be examined every twelve hours, swabbed daily, and given serum on the slightest suspicion of diphtheria.

Hæmolytic streptococcal infections.—Epidemics caused by the hæmolytic streptococcus are common and of the highest importance in children's wards. In dealing with epidemics it is wise to accept the essential unity of all the infections due to this organism, whether associated with a scarlatiniform rash or not.[32 44 46]

Centre-to-centre cot-spacing of 12 ft. prevents air-borne spread,[26] and transfer at greater distances suggests a staff carrier, or transfer by fomites, especially from a case with an infected discharge.

The Schultz-Charlton reaction is of less value in diagnosis than is the isolation of the streptococcus. The Dick test and Dick immunisation[1] are of proved value in classical scarlet fever, but in general streptococcal infections they are unsatisfactory because antitoxic immunity does not mean antibacterial immunity.[44] Serum, too, is valuable in the treatment of scarlet fever but not in other streptococcal infections, nor in the prophylaxis of scarlet fever, because of the uncertain results[29] and frequent serum reactions. Of the numerous types[24] of hæmolytic streptococci, apparently only about a third[25] are virulent to man, and they fall approximately into the Group A of Lancefield's classification.[35] The dangerous carriers are those from whom Group A streptococci are isolated in heavy growth,[9] and who have unhealthy throats,[23] or some discharge containing the organism. In practice it is probably safe to ignore carriers even of Group A, if the throat is healthy and the organism is isolated only in small numbers.

Upper respiratory infection.—Influenza and the common cold, which are virus diseases,[15 55] and the feverish cold, which is often due to the hæmolytic streptococcus,[8] are important because of the dangerous complications of mastoiditis and bronchopneumonia, which are not unusual sequels. It is important that both patients and staff should be

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isolated immediately there is a rise of temperature or complaint of a sore-throat; isolation of the common cold should not be delayed until the stage of coryza, and segregation should be adopted in the infectious [7] pre-coryzal stage of dryness of the throat, nasal obstruction, and sneezing. Before returning to the ward it is advisable that all convalescents from these infections should be swabbed again for the diphtheria bacillus and the streptococcus. Immunity acquired from an attack is transient, and the results both of active immunisation in influenza [55] and anti-catarrhal vaccination for the common cold [16] are unsatisfactory.

RESPIRATORY DISEASES WITH LONG INCUBATION

Measles is seen in London in large biennial epidemics, which affect most of the susceptible children. The over-all mortality is about 1½ per cent., but it is over 7 per cent. in those under two years [61] and measles has an unenviable reputation for causing lasting damage among infants and children.

Clinical diagnosis is not possible until the end of the highly infectious prodromal stage. The febrile coryza is suspicious but not pathognomonic, and since Koplik's spots are essentially evanescent their absence does not exclude measles. Earlier diagnosis with the help of the blood count is uncertain.[12 38] Though the developed condition seldom gives rise to difficulty in diagnosis, abortive cases, occurring both in the immunised and the unimmunised, are as infectious as the manifest condition. Hence it is scarcely possible to avoid repeated infection of children's wards with measles during the epidemic years.

The active immunity conferred by an attack is usually permanent. No method of producing artificial active immunity is known except that which follows a mild attack modified by serum, but passive immunity can be secured with convalescent or adult serum, and this has been attempted on a large scale in the London County Council area during recent epidemics. The report of the medical officer of health on the measles epidemic of 1933–34 [61] recommends immunisation by intramuscular injection of either convalescent (5 c.cm.) or adult (10 c.cm.) serum.*

The use of serum for ward contacts, and during epidemics for non-immune admissions, will limit the spread of infection. Children who then develop measles in the ward will, either because of a previous attack or because of recent passive immunisation, have a modified attack. Since the majority of susceptible children are attacked in any epidemic, the risk of acquiring such a modified attack in hospital cannot be considered greater than the risk of acquiring a fully developed attack of the disease outside. Under these circumstances we suggest that it is more reasonable to allow the occurrence of cases of measles in wards throughout epidemics, removing each case as it arises, than to waste valuable ward beds through repeated closure and disinfection.

Whooping-cough.—The infectivity of whooping-cough, like that of measles, is maximal during the obscure prodromal stage and gradually fades after the whoop has appeared.[33] Spread is by air-borne droplets, but in the opinion of Harries [28] such a spread can be prevented by adequate bed-spacing and efficient barrier nursing.

The available laboratory aids to early diagnosis are the cough plate, the blood count, the complement-fixation reaction, and the sedimentation-rate. Cough plating is the most reliable method and reports of the proportion of positives during the first week of the disease vary from 65 to 98 per cent. [20 34 39 51] The expense of special media, the skill needed in taking a plate, and the delay of 2–5 days before a result can be obtained are [54] however important objections to its use except in large diagnostic clinics. The blood count shows a lymphocytosis and often a raised total count,[22] but the picture is fully developed only in the spasmodic stage, and appears to be proportional to the severity of the spasms. Moreover, the blood picture of a secondary infection may be superimposed upon that typical of whooping-cough.[54] Though sufficient antibodies to produce partial fixation appear late in the disease,[13 47] and the test might be used to confirm a history of infection, and though characteristic alterations in the sedimentation-rate are reported, these means of diagnosis are at present too uncertain to be of any practical value.

An attack of the disease confers permanent immunity and a history of an attack is reliable. Passive immunisation of contacts with human convalescent serum has been attempted with unconvincing results.[31] Variable and recently more successful results in inducing active immunity have followed the use of vaccines.[13 19 39 40 53] The disease, however, is less infectious than measles, and early diagnosis, careful observation of contacts especially for the onset of an abortive attack, and (most important) the prompt isolation of any child with a suspicious cough until diagnosis is settled should minimise the spread of infection in the ward.

Small-pox.—Classical small-pox is rare and is unlikely to cause difficulty, but mild small-pox, or small-pox modified by previous vaccination,[49] in which the prodromal symptoms are slight, may be confused with chicken-pox. The latter can usually be distinguished by the centrifugal distribution of the lesions and their rapid vesiculation in a few hours.

Chicken-pox is so highly infectious that it cannot be nursed in bed isolation.[26] The diagnosis is usually easy, except that the vesicular type of papular urticaria may cause difficulty; but this condition is afebrile and there is usually a past history and at least one typical urticarial patch. Herpes zoster, especially in an older relative, should be considered a possible source of chicken-pox.[48] There is no helpful blood change during the incubation period.[58] The history of an attack indicates the presence of immunity. The value of convalescent serum is debatable,[28] but is probably nil.[36]

Mumps is a virus disease of low infectivity. In searching for incubating cases the submaxillary glands should be examined, and the possibility of abdominal pain being due to abortive mumps with pancreatitis should be remembered. The total white cell count usually falls, with a relative and sometimes an absolute lymphocytosis.[60] The history of an attack is evidence of immunity, and while experiments in active immunisation have been disappointing,[30] convalescent serum apparently confers some immunity.[5 28]

German measles has a variable infectivity [62]; it probably consists of two or more types, and the term includes some ill-defined infectious erythemata [3] which may be diagnosed by exclusion as German measles. The history of an attack is therefore of no value in assessing immunity. The morbilliform type is milder than measles and there is no prodromal period; the rash of the scarlatiniform type is rarely pure. The diagnosis during the incubation period can be suspected if the suboccipital or other glands

* It has been the experience of one of us (R. H. D.) that, in the absence of either of these, maternal whole blood in 20 c.cm. doses is a satisfactory substitute.

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become enlarged, and the blood picture, especially the Schilling count,[52] or perhaps the counting of Türk cells,[12] is of value at that stage, and also in the early distinction of measles, scarlet fever, and German measles.[38]

NON-RESPIRATORY INFECTIONS

Typhoid fever and dysentery.—The enteric group of infectious diseases seldom give rise to ward epidemics unless an unsuspected carrier or an undiagnosed case is by an oversight admitted into the open ward. The classical typhoid precautions are adequate, and cross-infection does not take place if they are carried out efficiently. It is, however, important to isolate any child with diarrhœa, or vomiting, or blood in the stools until his condition is known. Dysentery, usually of the Sonne type,[42] may be at first diagnosed as intussusception, and paratyphoid of sudden onset with sore-throat and vomiting may be attributed to upper respiratory infection.

Infantile gastro-enteritis.—For several reasons acute gastro-enteritis of infancy will be considered apart from other alimentary infectious conditions. No children's ward is long without a case of the disease, which is then a menace to every infant in the ward. Moreover the fatality-rate, though variable, is far higher than in any other infectious disease. In spite of this, a casual attitude is often developed to the disease because it has no notorious label, and it is forgotten that the spread of infection in a ward indicates a failure in technique, and that scrupulous adherence to a correctly conceived plan will reduce such spread to small proportions.

Primary gastro-enteritis behaves as if it were a disease spread by a specific organism flourishing in the bowel and excreted in the stools, and indeed, the causal organism is not infrequently dysenteric.[14] The disease is so highly contagious that a nurse, during her routine duties, or a doctor doing a round, may in spite of ordinary cleanliness transfer infection from infant to infant. Secondary gastro-enteritis is most common in weakly infants in the winter months and is usually secondary to a respiratory infection.

An essential point in the prophylaxis of primary gastro-enteritis is the separation of the duties of napkin-changing from those of feeding [43] (as is done at the Birmingham Children's Hospital) and allowing no nurse who attends to an infant with loose stools to attend to other infants. As a measure against secondary gastro-enteritis no one with an upper respiratory infection should be allowed to attend to any infant, and it should be realised that the air-borne and hand-to-hand spread of streptococci from a patient or an attendant in whom no evidence of infection is present can lead to a fatal diarrhœa. In the care of infants, masking and the washing of hands are essential.

Vulvo-vaginitis is common in children and it is sometimes caused by the gonococcus. The importance of an epidemic of gonococcal infection both to the children and to the reputation of the hospital makes it essential to treat all those children with a purulent vaginal discharge in rigid isolation until the condition has been shown to be non-gonococcal. (A recent London County Council report deals fully with this question.[63])

THE BUILDING AND THE STAFF

The main purpose of this paper is to indicate how the incidence of infection can be reduced in children's hospitals and in the children's wards of general hospitals, built on the old plan of large single wards often without special facilities for the isolation of new patients. The aim in considering structural modifications should be not to approximate to the ideal children's hospital, but to facilitate a suitable nursing and isolation technique with as little radical change as possible.

A children's hospital based on modern ideas of infection would incorporate:—

1. An admitting ward of separate cubicles, with an examination room, and with its own nursing staff, kitchen, and sanitary arrangements.
2. Small wards of 4–6 cots and a balcony. Kitchens and sterilising plant would serve several wards.
3. Cross-ventilation and adequate bed-spacing.
4. One or two cubicles to each ward for the nursing of infectious cases.
5. Wards for infants only.
6. A milk kitchen where feeds are prepared by nurses not on ward duty.

For the old-fashioned hospital the most practical and valuable of these are the admitting ward and the milk kitchen. An admitting ward is a filter in which many carriers, incubating, and suspicious cases will be caught, and it is conveniently arranged as a series of glass cubicles opening on to a common passage. A milk kitchen staffed by nurses who do not come into contact with ward infections guarantees sterile feeds, and is of experimental value and useful for teaching students and nurses.

The value of separate infants' wards is debatable, and unless a ward can be reserved for infectious cases it is safer to seed the infants amongst the older children.[17] The practical difficulties of converting existing space into isolation wards with adequate ventilation are usually insurmountable, as the gain from smaller units is more than offset by the loss of efficient ventilation due to subdivision. Of greater value is the addition to the ward of two or three cubicles, a number of movable glass screens, and the adoption of adequate cot-spacing. Permanent partitions, if used at all, should be placed between adjacent beds, where they will not interfere with cross-ventilation, and they should not reach to the ceiling.

If there is no anteroom which can be converted cubicles can conveniently be built at the end of the ward nearest the sink-rooms. Each cubicle should have a window, a washing-basin, and a floor space of 10 by 10 ft., which allows nursing around three sides of the cot.

Movable glass screens are invaluable in the large many-bedded wards, and they can be used to isolate a single case or to segregate a group of children. They are easily disinfected and cost less than cubicles. The screens and partitions should be at least 7½ ft. high.[46]

Staff prophylaxis.—The medical, nursing, and lay staffs must be vaccinated against small-pox. They should also be Schick-tested, and if positive, actively immunised, a control Schick test being made three months later. All nurses, students, and ward-maids should have their throats swabbed, both for the diphtheria bacillus and the hæmolytic streptococcus, two days before their appointment to a children's ward.

No member of the staff can be sufficiently indispensable to justify the consequences of a respiratory epidemic. They must be excluded during the infectious period of the common cold, and take no part in the preparation of food. Nurses destined for duty in a children's ward should be given instruction in the elements of infection and immunity.

Visitors should only be allowed to children who are seriously ill, and then only if they are free from infection and wear a gown.

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WARD ROUTINE

The full routine of bed isolation recommended for fever hospitals [50] is both impracticable and unnecessary in general wards, but modifications as suggested by Okell and Elliott are of great value as a basis for preventive routine.[46]

Open ward, not in quarantine.—Cot-spacing of at least 10 ft. from centre to centre is advisable, but children are allowed to play together in the ward. Each child should have his own locker, washing materials, medicine glass, and thermometer, with no possibility of interchange; wooden spatulæ should be used and discarded after use. All crockery should be boiled after use before being returned to the kitchen. Bedpans should have lids, not cloths, and should be boiled. Vacuum cleaners and wet dusting should replace dry dusting.

Open ward, in quarantine.—Enough children should be discharged to increase the centre-to-centre cot-space to at least 12 ft. and preferably 15 ft. Interchange of toys and books must cease, and all children must be confined to their cots until the quarantine period is over, except in long-incubation diseases, when the confinement may be limited to the last ten days.

ISOLATION TECHNIQUE

Simple isolation is suitable for cases under suspicion of being infectious, or actually suffering from the milder upper respiratory infections. The child is in a cubicle or behind a screen, and no unauthorised persons (particularly ward-maids) are allowed in the infected area. The number of nurses attending to the case must be limited and temporary nurses not allowed; nor should nurses attending to infants have entry.

Additional equipment will be required—namely, gowns for the medical officer and nurse, which may be hung on the screen, and a supply of gauze masks, a wash-basin, disinfectant, and towels for the attendants. Gauze masks must be discarded after use for they are only of transient protective value to the wearer, and do not prevent the dissemination of any infection he may have. Linen must be placed in disinfectant when discarded, but the sterilising room, wash-up, and sink of the general ward may be used.

Special isolation is suitable for cases of infantile gastro-enteritis, typhoid, erysipelas, pemphigus, and vulvo-vaginitis, and for cases too ill to be transferred to a fever hospital. The child must be in a cubicle, not behind a screen, and there should be a special sink-room near the cubicle. A special nurse is necessary, who does no cross-nursing. She must be forbidden to enter the kitchen, and to avoid the general ward and contact with other nurses until she has changed and bathed after going off duty.

The additional equipment required comprises rubber gloves, to be worn by nurse and doctor when touching the patient; special crockery and cutlery, with washing and sterilising facilities separate from those of the general ward, and preferably just outside the cubicle; a special bedpan and urine bottle, cleaned and sterilised in the special sink room; a stethoscope, since the medical officer should leave his own stethoscope outside, and a table outside the cubicle, to which a clean nurse can bring food and supplies. Facilities must be provided for disinfection of linen and excreta before disposal.

Rule for entering an infected area.—All those who enter an infected area must wear a gown and mask, and if the case is under special isolation, rubber gloves. Instruments such as stethoscopes should be used first, before the hands are contaminated, and left in disinfectant, if practicable, while the rest of the examination is proceeding. All notes are made with a pen provided. Before leaving the area the hands should be disinfected, the gown and mask removed, and the hands carefully washed. The medical officer and visiting staff should visit the general ward first, then children on simple isolation, and then those on special isolation.

The successful prevention of infection depends ultimately upon the efficiency with which the technique for the admission, nursing, and isolation of patients is carried out. If this technique is faulty, the ideal planning of a hospital to reduce infection will inevitably fail, whereas if there is careful nursing, adequate bed-spacing, and maintenance of the "invisible barrier"[28] several infectious fevers may be simultaneously nursed in the same open ward without spread.

It is essential, first, to avoid admitting cases which are carrying or incubating diseases the hospital is not prepared to treat; secondly, to know beforehand to which diseases the patients in a ward are susceptible so that if the necessity arises, immunes and non-immunes can at once be redistributed, and the latter, if possible, immunised; and thirdly, to have a ward technique that will not only limit the spread of infection from a known source, but can be applied immediately the suspicion of infection arises.

A SET OF RULES

The following rules are based upon those at present adopted in the children's wards of University College Hospital, and are set down dogmatically for the sake of emphasis.

On admission to hospital.—(1) The history and examination should include all information relating to past attacks of infectious disease, recent contact, and any prodromal signs and symptoms. This information will become valuable when ward infection occurs and will sometimes lead to the detection of an infectious case in the prodromal stage. (2) On the day of admission the throat, nose, and any aural or other discharge are swabbed both for the diphtheria bacillus, and the hæmolytic streptococcus. Diphtheria carriers remain isolated, and if the virulence test is positive are sent to a fever hospital. Virulent hæmolytic streptococcal carriers are nursed under simple isolation technique. (3) All children are Schick-tested within 24 hours, and positive reactors may be actively immunised. (4) All new admissions are isolated for 48 hours, and until the swab reports have been returned negative. They will be in simple isolation in an admission ward, in a cubicle, or in the main ward behind a glass screen.

The main intention of these rules is the elimination of gross carriers, and the collection of information allowing of immediate action when infection occurs.

In the ward, at all times.—The majority of the children will be in the open ward, and not isolated in any way, but each ward will also have children in cubicles and behind screens.

1. The isolated children will be drawn from the following sources: (*a*) new cases during the first 48 hours, and during the investigation of the swabs; (*b*) infectious cases not transferable to a fever hospital (e.g., mild upper respiratory infection); (*c*) cases awaiting removal to a fever hospital, or the result of a virulence test; and (*d*) cases removed from the ward because of suspicious signs or symptoms (e.g., infants with loose stools and pyrexia).

2. Children in the ward developing any of the following symptoms must be isolated immediately

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by the sister in charge: sudden unexpected pyrexia; a rash; sore-throat or common cold; loose stools with pyrexia; aural, nasal, or vaginal discharge; or any other suspicious sign, such as spasmodic cough (especially if nocturnal or accompanied by vomiting), coryza or repeated sneezing, and blood in the stools. This must be a standing rule for the nursing staff, and the suspected child will thus be safely isolated until the responsible medical officer can decide the action to be taken.

The screens and cubicles are to a large extent interchangeable, but the cubicles should be kept for more dangerous conditions, and for those requiring prolonged isolation; the screens can be used for apyrexial new cases which are presumably not infected.

3. Every isolated child must be treated as if actually infectious, with the precautions of simple isolation, unless the special precautions are indicated.

On the occurrence of infection in the ward.—Despite all precautions infection will sometimes arise in the ward, but the spread can be limited by the following measures, and closure of the ward will seldom be necessary.

1. Isolation of the initial case—i.e., removal to a cubicle pending transfer to a fever hospital.

2. Determination of the source of the infection. A thorough search for carriers and abortive cases should be made amongst the staff and patients.

3. Redistribution of immunes and non-immunes. Inter-cot spacing should as far as possible be increased to 15 ft. by the discharge or transfer of suitable cases. In all infections other than diphtheria and those due to the hæmolytic streptococcus, the children should be redistributed so that the immunes who cannot be carriers, act as buffers between the susceptibles. This should be done to ensure the maximum distance between any two susceptibles, any one of whom may be incubating the disease and infect any other. In the event of diphtheria the Schick-negative potential carriers should be placed together at one end of the ward, and separated from the Schick-positives by a barrier of the movable screens.

In hæmolytic streptococcal infections the Dick test cannot be similarly used, but those found to be carriers should be placed in simple isolation, and the organism typed. If the carriers are too numerous the best that can be done is the separation of carriers from non-carriers by the screens, and later type-segregation, if practicable, may be adopted.[32]

4. Immunisation of the susceptible children at present applies only to diphtheria and measles. In the case of diphtheria 4000 units of antitoxin may be given to all Schick-positives, or the alternative method [45] already mentioned may be adopted. Susceptible measles contacts can be given convalescent or adult serum or parents' whole blood as detailed above.

5. Every twelve hours all contacts must be examined for prodromal signs, with full use of clinical and laboratory aids, and isolated on the slightest suspicion.

6. In diphtheria and hæmolytic streptococcal infections there is no lasting immunity, and new patients should not be admitted until the ward is free from infection, except for Schick-negative children in the case of diphtheria. Where the ward infection is measles, patients may be admitted if they give a history of a past attack, or if they receive an immunising dose of serum.

With whooping-cough, after the first case, admissions may continue, but if other cases occur the admission of susceptible cases should cease until the expiration of the quarantine period.

The other mild infectious fevers rarely give rise to serious complications, and admissions may continue unless several cases occur in the ward at the same time, when non-immunes should be excluded until the expiration of the quarantine period.

SUMMARY

1. Infection cannot be entirely eliminated from children's wards.

2. Careful admission technique will greatly reduce the initial infection and careful ward technique will greatly reduce its spread.

3. Application of newer knowledge of infection and immunity will considerably diminish the frequency with which wards are closed on the appearance of an infectious fever.

4. A scheme is suggested which, when modified to suit local conditions, should make such closure unusual even during times of epidemics.

5. Emphasis is laid on the value of cubicles and of movable glass screens, for the isolation of new cases during the first 48 hours, and for the prompt isolation of ward cases on the first appearance of suspicious signs or symptoms.

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SECONDARY CARCINOMA OF BONE*

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IT may be said of cancer that while clinical, pathological, and surgical observations have taught us a great deal about its early stages, apart from its actual cause, and post-mortem examinations have told us practically all there is to be known about the stage at which it causes death, our knowledge of its intermediate stages is still defective. Of the spread of the disease we only catch periodical glimpses from clinical and radiological observations and for the rest of our knowledge we are dependent on reconstructing the process from post-mortem findings, a method which is not always reliable. Yet the intermediate stages are probably the most important, because of the success to which treatment of the primary growth whether by surgery or radiation has attained. But interest is still mainly concentrated on the early stages. Follow-up records are usually cast in a form designed to show the success of a particular kind of treatment of the initial growth, and rarely give us information about the subsequent course of events. It would incidentally be of great value to know whether secondary manifestations differ in kind as well as in frequency after different forms of treatment of the primary tumour.

Let us take a very common occurrence. A carcinoma is removed from the breast, completely so far as can be seen, by Halsted's operation. The patient is perfectly well for some years and then with no sign of local recurrence develops a metastasis in a lumbar vertebra or the upper end of the femur. How do the malignant cells reach their new situation, why do they grow there, and, above all, what has been happening during the long interval of apparently good health? Many regard the appearance of a skeletal metastasis as the beginning of the end. Their minds influenced by the typical post-mortem appearances, they imagine the patient to be already riddled with deposits and therefore beyond help except from opiates. This is to take an entirely erroneous and unduly pessimistic view. With adequate treatment considerable and sometimes complete relief from symptoms may be attained for a substantial period.

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DISTRIBUTION OF METASTASES

We may first consider certain features in the distribution of distant metastases. These may be stated in the following general rules.

1. Some kinds of carcinoma are more liable to form distant metastases than are others. The commonest carcinomas to form metastases in the skeleton are those from the breast, kidney, prostate, and thyroid. Those from the uterus, ovary, rectum, and pharynx do so less frequently. Such differences are of course not always attributable to any inherent differences in the capacity to metastasise, but to the fact that some primary growths, owing to their situation, kill before metastases have time to form.

2. Metastases are more liable to form in some tissues than in others. They are commonest in bone, liver, and brain, rare in the spleen, while skeletal muscle appears to be almost immune. Virchow laid down the law that secondary growths are common in tissues in which primary growths are rare, and vice versa. The general truth of this law can be shown by many instances. In the small intestine primary growths are rare but secondaries very common; in the uterus the reverse is the case if we except secondary involvement by direct extension. It is very significant that secondary deposits from carcinoma of the breast occur far less often in the other breast than in bone. One would expect a similar tissue to be the ideal site for colonisation. The fact seems to show either that tumour cells have greater mechanical difficulty in finding lodgment in the opposite breast than in bone or that when detached from the main mass they change their biological characters so as to require an entirely different soil for their development.

3. The favourite site for secondaries varies according to the site of the primary. Breast usually metastasises in bone, lung shows an unusually high proportion of secondaries in the brain and spinal cord. Secondaries in the liver are more frequent from growths in the portal area than from growths elsewhere.

4. Within the skeleton there are favourite sites. In general these are the same for all forms of carcinoma except that carcinoma of the thyroid seems to metastasise with greater frequency in the skull. Post-mortem examination, when dissemination is widespread, shows that the commonest sites are the spine, upper end of femur, pelvis, skull, and ribs, the part most frequently involved being the lumbar region of the spine. X ray examination by Lenz and Freid (1931) of cases exhibiting symptoms of metastases from carcinoma of the breast showed that the first site of metastases was as follows: lumbosacral vertebræ 28, femur 12, pelvis 11, skull 10, thoracic vertebræ 4, ribs 4. Carnett and Howell (1930) and Willis (1934) attribute the greater frequency in the lumbosacral region than in the dorsal to the greater bulk of the former. It is not easy to see why the size of a bone should affect its liability to become the seat of metastases for there is little difference in total bulk between the two regions. In those of my cases of breast carcinoma where symptoms have led to the discovery by radiological examination of early metastases, these have been situated as follows:—

Case		Case	
1	Head of right femur and right ischium.	7	Twelfth dorsal.
2	Left seventh rib.	8	Pelvis and tenth dorsal.
3	Seventh dorsal vertebra.	9	Skull.
4	Eleventh and twelfth dorsal.	10	Second lumbar.
5	Ninth dorsal.	11	Ninth dorsal.
6	Sixth dorsal and first lumbar.	12	Skull.
		13	Eleventh and twelfth dorsal.

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Although my observations are not in complete agreement with those of Lenz and Freid, they agree in showing that the main incidence of breast metastases occurs in those parts of the skeleton through which the weight of the body is transmitted and which first show senile changes. This does not mean that the appearance of metastases is preceded by spondylitis but the evidence does suggest that bone can resist the growth of metastases better when it is strong than when it is weakened, or, in other words, that in the development of metastases the strain of the body-weight is a contributory factor. Metastases from the prostate in my experience show quite a different distribution. Taking again only early cases, they appeared as follows:—

Case	
1	.. Left pelvis.
2	.. Both ilia; second lumbar vertebra.
3	.. Second lumbar vertebra.
4	.. Second lumbar, followed by fourth lumbar and ilia.
5	.. Second lumbar, followed by left pelvis and left femur.

It may be argued that the number of cases is too small to prove any special liability of the second lumbar vertebra. What is very significant however is the fact that in these cases the invasion of this vertebra was complete, the vertebræ above and below remaining free until after the pelvis was involved.

APPEARANCE AND SPREAD

The interval between the discovery of the primary growth and the first appearance of skeletal metastases varies considerably. The longest interval in my series is 14 years (after removal of a carcinoma from the breast). It is of course well known that metastases, more especially those from the prostate and kidney, may appear before the discovery of the growths from which they are derived. Radiography of the spine for obscure lumbar pain not infrequently reveals osteoplastic carcinoma although the prostate shows no abnormality on palpation.

When first discovered metastases may be single or multiple, in the latter case sometimes involving adjacent bones but far more often appearing in separate situations—e.g., in a mid-dorsal and a lumbar vertebra, or in a dorsal vertebra and the pelvis. It is noteworthy that the gradual spread of metastases takes place irregularly, parts of the skeleton that show advanced disease being separated by regions little affected. Dissemination must therefore be due neither to direct extension from the bone first affected nor to spread along a regional path, but to the development at different periods of independent centres scattered indiscriminately.

The rate of growth of individual metastases even when untreated is usually very slow. Few opportunities of actually measuring it present themselves to those engaged in treatment. A patient referred to me had an osteoclastic metastasis involving a rib for a distance of 10 cm. An X ray examination carried out four months previously had shown the lesion to be of exactly the same length. Evidently an effective barrier had been set up at both ends.

CLINICAL AND RADIOLOGICAL FEATURES

Pain is always prominent. It may be very acute and persistent and can be either referred or localised. When the pain is localised, as for instance in the ischium, the patient can usually indicate the exact site of the lesion. Persistent pain, whether localised or referred, in a patient known to have or to have had a malignant growth should always arouse suspicion of metastasis. Only too frequently it is attributed to lumbago or sciatica. Radiological examination almost invariably confirms the diagnosis. As is well known skeletal metastases are of two types, osteoclastic and osteoplastic. Those from the prostate are practically always osteoplastic, those from the kidney and thyroid usually osteoclastic. The breast gives rise to the osteoclastic type in the majority of cases, 14 per cent. showing osteoplasia according to Kaufmann, while in some cases osteoclastic and osteoplastic changes appear side by side. The osteoclastic type—the so-called "bone-eater"—is characterised by single or multiple areas of erosion having sharp irregular margins. Cartilage is immune to attack and acts as a barrier to the spread of the invasion. In the vertebræ the disease is usually confined to the bodies, the pedicles and laminæ being involved more rarely. In the osteoplastic type the affected bones appear abnormally dense and thickened by subperiosteal deposits of new bone. The uniformity of the change distinguishes it from osteitis deformans.

Can metastases always be recognised radiologically? In the great majority of cases they can, the radiographic appearance and the symptoms agreeing with remarkable precision. As in osteomyelitis, however, there may be symptoms before enough time has elapsed to produce changes that can be determined radiologically. Radiography soon after the onset of pain may give a negative result, the typical changes being visible on subsequent examination. That in mixed cases the simultaneous osteoclastic and osteoplastic processes may balance each other to the extent of leaving the appearance of the bone normal can, I believe, happen only very rarely, for the two processes can be distinguished in different bones or in different parts of the same bone.

PATHOLOGY

In the osteoclastic type the cancer cells fill the Haversian canals and surround the bony trabeculæ. Bone is eroded and its place taken by tumour cells surrounded by a connective tissue stroma. Osteoclasis occurs not in contact with the malignant cells but some distance away at the outer margin of the fibrous zone, and therefore appears to be part of the reaction rather than a direct effect. Necrosis of cancer cells at the margin of growth is a conspicuous feature and is due to blockage of blood-vessels by the cells themselves. In the osteoplastic type bone tissue is stimulated to proliferation with the result that the trabeculæ are thickened and new bone deposited sub-periosteally so that eventually compact bone is formed. The essential difference between the two types is solely one of reaction. In the osteoclastic type it is fibrous, in the osteoplastic type osseous, the type being determined presumably by the biochemical characters of the tumour cells. In both types the striking feature is the amount of reaction that is set up. "The extent of the connective tissue stroma about osteoclastic secondary growths," says Willis, "may decidedly exceed that of the growths themselves." Wagoner (1930) noted the close resemblance to osteitis fibrosa. Similarly the osteoplastic process was described by von Recklinghausen (1891) as a carcinomatous osteitis. This view is supported clinically by the predominance of pain and the usually very slow rate of growth. Inasmuch as pain is attributable to an inflammatory reaction within a confined space there seems to be some justification for regarding the process as a subacute malignant osteomyelitis.

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FORMATION OF METASTASES

Let us now consider the case where amputation of the breast and axillary contents is followed some years later by the appearance of one or two distant metastases with no sign of local recurrence.

By what route do the malignant cells reach their new site? Before Handley (1922) put forward his theory of permeation along the lymphatics, there were no two opinions on the matter, for it was universally assumed that transference took place by the blood stream. Aschoff (1911), for instance, accepted this view without even discussing it. While acknowledging the importance of Handley's view in regard to certain modes of spread it is very difficult to accept it as an explanation of the formation of distant metastases. Cogent reasons against this theory have been advanced by Fitzwilliams (1924). Moreover Willis has failed to find microscopical evidence of tumour cells in the fascia and soft parts in the neighbourhood of secondary growths of the femur, while in only a small proportion of cases did he find enlargement of the regional lymph glands near any involved parts of the skeleton. The very existence of lymphatics in the bone-marrow is open to question. Piney (1922), in agreement with most observers, denies their existence, though Kolodny (1925) by an injection method claims to have proved it. It is difficult to understand how lymphatic spread can cause metastases in a tissue in which lymphatics are, to say the least, inconspicuous. The distribution of metastases, the occurrence of single metastases in a site far distant from the primary lesion, the appearance of two or more metastases in widely separate parts of the skeleton, and the geographical irregularity in the general invasion which I have described above, appear to me to be indisputable proof of spread by the blood stream. There is further the fact that the liver is the site of metastases more frequently in carcinoma arising in the portal area than in carcinoma arising elsewhere although the intestinal lymphatics do not drain into the liver. As Fitzwilliams has pointed out, the traditional teaching that sarcoma spreads by the blood and carcinoma by the lymphatics does not rightly express the facts. It would be more correct to say that while sarcoma spreads chiefly by the blood stream, carcinoma spreads by both routes in a proportion depending upon its situation. It is the capacity for hæmic spread that is the chief danger in carcinoma.

That metastases from the prostate first appear in the lower part of the spine and the pelvis seems at first sight to indicate a lymphatic spread. But although the prostate has abundant lymphatics and although according to Kaufmann carcinoma arising there produces skeletal metastases in about 70 per cent. of cases, Ewing (1931) finds that lymphatic invasion is less prominent than in many carcinomas, being usually confined to the glands in the true pelvis lying close to the seminal vesicles. The special liability of one lumbar vertebra to be involved first as shown above is difficult to explain. The only connexion between the prostate and the second lumbar vertebra is that the prostate derives its sympathetic nerve-supply from the second and third lumbar segments of the cord. This suggests that some trophic factor plays a part.

The cells reach the blood stream either by the lymphatics and thence into the veins or directly into the veins. As we have abundant post-mortem evidence of the ease with which veins are invaded the latter seems to be the most probable.

That the cells should reach the blood stream *after* operation is almost inconceivable, for the possibility that there should be cells left behind which subsequently wander into the veins without showing any signs of local growth is extremely remote. The danger of dissemination *during* and as the result of operation has recently been much discussed, more especially in connexion with the advisability of biopsy for bone sarcoma. It seems to be impossible to settle this important question clinically. Experiments however on artificial tumours in mice by Tyzzer (1913) and Wood (1919) suggest that the risk has been exaggerated. There seems to be little doubt that the cells escape into the blood stream *before* operation, for distant metastases very frequently arise from small and early tumours. The question therefore arises whether the chances of dissemination are increased by mechanical factors such as palpation. Tyzzer found that massage of subcutaneous tumours in mice increases the incidence of metastases. If this observation is applicable to human tumours—if by palpation of a tumour cells can be squeezed into the blood stream as pips are squeezed out of an orange—the fact clearly indicates the supreme importance of gentleness in handling tumours and avoidance of unnecessary examination. On the other hand a patient who has for long concealed a mammary growth will almost certainly have herself submitted it to a fair amount of palpation out of curiosity.

Is the passage of a cancer embolus from breast to a vertebra a single event or part of a general showering of emboli into the systemic circulation? Theoretically this must depend in part on the size of the embolus. We have seen that in the majority of cases single metastases are restricted to certain situations which in point of bulk form but a small part of the whole body. If the embolus is small enough to pass through the systemic capillaries it can of course travel round and round the circulation until chance takes it to one of the places favourable for its growth. It is generally held by pathologists however that even single carcinoma cells are unable on account of their size and shape to traverse the systemic capillaries. If this view is correct tumour emboli must be caught in the first arteriole or capillary they meet. Since the chances are extremely remote of one embolus being lodged on its first journey in the region in which it is most likely to thrive, it follows that this one embolus which after long lying dormant gives rise to a metastasis must be one of a large number, the others developing at a later period or undergoing destruction or remaining dormant permanently. Thus only a small number of emboli succeed in forming metastases. This view agrees with the fact that post-mortem examination frequently reveals tumour emboli showing signs of degeneration within thrombi. The general dissemination which eventually ensues is more probably due to activity of hitherto latent emboli than to tertiary spread from an early metastasis.

In travelling from breast to bone do the tumour emboli pass straight through the pulmonary capillaries or are they arrested there? Schmidt (1903) believes that they are invariably caught in the lungs, that the majority of them are destroyed, but that some acquire an extravascular position where they grow and send forth emboli into the pulmonary veins and hence into the systemic circulation. His reason is that emboli are nearly always found post mortem in arterioles of 50–150 μ. In this opinion he is supported by Willis (1934) who found the average size of

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blocked arterioles to be 210 μ, the smallest being 15 μ. Willis further believes that emboli from the original tumour are fragments of considerable size, the escape of isolated cells being exceptional. This view, if correct, would explain the long latent period which may exist before the appearance of distant metastases. It would mean that between the period of local involvement and the period of general dissemination there is an intermediate period during which there is latent infection of the lungs. There are however arguments against the contention of Schmidt and Willis: (1) Even if tumour emboli are showered from the original tumour as cell aggregates it is hard to imagine that these should be unaccompanied by isolated cells. (2) The reason why Willis saw no blocked vessels smaller than 15 μ may have been because emboli smaller than this found no difficulty in passing through the capillaries. (3) Lung appearances found post mortem may not be the result of the first passage of emboli through the lungs but may be the result of later dissemination from skeletal and other metastases. (4) If emboli in the lungs can grow sufficiently to spread from the arteriole to the venous side it seems inconceivable that some of them at least should not be able to develop into metastases large enough to cause pulmonary symptoms and to be recognisable radiologically. I am now engaged on an investigation of this question and though the work is not complete those patients with early skeletal metastases whom I have examined have shown no abnormality in the radiological appearance of the lungs. Pulmonary involvement in fact is much less common than is often supposed except as a terminal event.

This question is of more than academic interest for if the existence of an intervening period of lung invasion were substantiated it would clearly indicate that prophylactic X ray therapy should be directed to the lungs. Some radiotherapists, however, avoid the lungs because of the risk of damaging the pulmonary epithelium. An attempt to settle the question therapeutically would be a formidable undertaking with a result arrived at only by statistics, and rendered the more complex by the many other factors involved.

Finally, why are metastases specially liable to develop in bone? To this question we have so far no satisfactory answer but have to fall back on the assumption either that for mechanical reasons connected with the arrangement of the blood-vessels emboli are more easily caught in bone-marrow than elsewhere or that the bone-marrow provides a nidus which is especially suitable biochemically. Willis attributes the infrequency of metastases in the distal parts of the limbs to the fact that here the marrow is of the yellow type.

TREATMENT

X ray therapy has a remarkable effect upon skeletal metastases, especially those of the osteoclastic type. Applied to early cases when only one or two bones are involved it causes in nearly all cases complete disappearance of pain with restoration of working capacity which lasts for months or even years, until general dissemination occurs. If collapse has not taken place the normal appearance of the bone is sometimes restored, but the functional result is the same whether this restoration is visible or not. In more advanced cases where several bones are involved the improvement is not so striking, but even in these considerable alleviation of suffering can be effected. In the osteoplastic type secondary to the prostate the results are less uniform. In some cases however complete relief may be obtained for a period of 1–2 years.

As regards dosage I employ a beam of 200 kv. filtered through 1 mm. Cu. + 1 mm. Al. The size of the field and the dose naturally depend upon the site affected. For a lumbar vertebra a beam of 8 by 10 cm., or 10 by 15 cm., at a distance of 40 cm. is advisable, using two fields obliquely from the back, or laterally according to the size of the patient. Through each field is given 1000 to 1200 r measured on the surface, within 10 days, the bone receiving a dose from the combined fields of about 500–800 r. This dose is usually sufficient. If further radiation is found necessary two oblique fields from the front and a posterior field directly over the spine can be used. It is significant that the dose required is much smaller than that necessary for primary carcinoma. Metastases are usually more radiosensitive than the primary tumours from which they arise. This fact indicates that carcinoma cells colonising in a strange locality are of lower vitality than those growing in their original habitat.

ILLUSTRATIVE CASES

CASE 1.—Woman aged 68. Inoperable carcinoma lying in the outer and lower quadrant of the right breast with enlarged glands in the axilla. Two years' history. For the last month pain in the back radiating to the right side. Radiography (June, 1935) revealed collapse of the IXth dorsal vertebra. A month later after X ray treatment the pain had completely disappeared. She remained perfectly well until 1937 when she complained of pain in the lumbosacral region; radiography showed a secondary growth involving the greater part of the left side of the sacrum. X ray treatment applied here produced complete relief. She now only suffers from pain in the side for which the tumour in the breast is chiefly responsible.

CASE 2.—Woman aged 50. Scirrhous carcinoma removed from the breast in July, 1936. Six months' history. In January, 1937, she complained of pain in the back and pelvis which radiography showed to be due to osteoclastic metastases causing compression of the Xth dorsal and extensively involving the left side of the pelvis. After X ray treatment there was not only complete relief of pain but re-formation of the normal density of the bones in both situations, the pelvis presenting a normal appearance. The patient is now in good health.

CASE 3.—Woman aged 42. Spheroidal-celled carcinoma removed from the breast in 1931. In July, 1935, metastases appeared in the VIth dorsal and IInd lumbar. After X ray treatment she lost her symptoms, was able to do full housework, and in December, 1935, declared herself better than she had been for a year. Later, however, secondaries developed in the liver from which she died early in 1937.

CASE 4.—Woman aged 57. Admitted in May, 1936. Pain in the right hip for 9 mths. and in the right leg for 3 mths. Tenderness over the crest of the left ilium and right sacro-iliac joint and extreme tenderness over the right XIIth rib. A large mass in the left hypochondrium was found to be due to a renal tumour. Radiography showed destruction of the head of the right XIIth rib and the posterior parts of the XIIth dorsal vertebra. After X ray treatment to this region and to the tumour she became completely free from pain and by April, 1937, had gained 1 st. 4 lb. in weight. She declared that she had not felt so well for years. In June, 1937, pain recurred and again disappeared on treatment. In August pain recurred associated with an attack of herpes on the right side of the abdomen. In November, 1937, she developed paraplegia and died shortly after.

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CASE 5.—Man aged 51. In June, 1933, he complained of severe lumbar pain which was worse when resting and when warm in bed. There was paræsthesia of the inner side of the right thigh and knee along the distribution of the internal cutaneous nerve (L. IIIrd and IVth). He had had four similar attacks since October, 1932. Radiography revealed typical osteoplastic carcinoma secondary from the prostate, though there were no symptoms or signs of any primary growth. X ray treatment begun in August, 1933, and repeated periodically left the patient practically free from pain and in fair health for nearly two years. Meanwhile the secondary involvement spread slowly and he died in March, 1936.

The effect of X ray treatment upon local metastases lasts until widespread dissemination makes its appearance in the bones, liver, and elsewhere. If generalised metastases are derived by a tertiary process from one or two early metastases there would be grounds for believing that treatment to the latter directly delays general dissemination. But if, as seems more probable, early metastases are merely precocious forerunners of others lying latent throughout the body, treatment of the former may at least delay the general development of the latter indirectly by preventing such lowering of general body resistance as may be caused by the early metastases. However this may be, there is no doubt that although at this stage cure is out of the question, X ray treatment is of incalculable benefit. It relieves pain and substantially delays and thus shortens the period of invalidism which is the end of most cases of cancer.

SUMMARY

1. The distribution and spread of skeletal metastases support the hæmic as opposed to the lymphatic theory of dissemination.

2. The escape of cancer emboli into the blood stream is a multiple event. The site of lodgment of emboli is a matter of pure chance, but the development of emboli into metastases depends mainly upon the suitability of the soil coupled with lowering of bodily resistance, other possible factors being mechanical strain and a trophic element.

3. The structure of metastases, their slow growth, and their sensitiveness to radiation suggest that their growth meets with considerable resistance.

4. It is improbable that the lungs are a site of an intermediate stage in dissemination.

5. Isolated metastases in the skeleton, preceding general dissemination, are of common occurrence. Their existence should always be suspected when patients complain of persistent pain.

6. X ray treatment is effective for early metastases. It relieves pain, sometimes with re-formation of normal bone, probably prolongs life, and certainly diminishes to a great extent the period of invalidism.

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BLOOD CHANGES IN ANXIETY STATES

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PRESENT knowledge of the blood changes in emotional states is derived from many sources.

From the physiological side, the work of Cannon and Mendenhall (1914) showed that stimulation of afferent nerves or emotional excitement—pain or fear—shortened the coagulation time, but not when the sympathetic supply to the adrenals was cut. The immediate reaction to an injection of adrenaline was also to shorten the coagulation time. Maranon (1921) found that in certain persons "psychically sensitised in childhood," small injections of adrenaline will produce a true emotional reaction as well as the normal somatic response.

Menkin (1928), by exciting normal cats psychically for 10–15 min., produced a relative mononucleosis up to 15 per cent. which returned to normal in 30 min. Division of the sympathetic nerves to the adrenals prevented the change. On the other hand, Mora, Amtman, and Hoffmann (1926) report a relative polymorph leucocytosis in all patients exhibiting fear before operation. Dobreff and Tomoff (1932), also using patients about to be operated on, and examination candidates, stated that "in the dull asthenic type, anxiety produces definite somatic changes, such as tachycardia, hypertension, hyperglycæmia, and leucocytosis."

Wittkower (1929), with many others, believes that the leucocyte counts, total and differential, in any given vessel, are under the direct control of the autonomic system, and that this sytem has a selective action on counts in different parts of the body at the same time. Under deep hypnosis, he placed 5 of his patients in states of strong affect and at intervals of 5 min. took samples of the blood. His conclusions based on these and some 50 others which he does not specify are that in hypnosis and sleep there are no material changes in the leucocyte number, but if sufficiently strong affect is present there is a leucocyte increase of from 2000–5000, the differential count remaining normal, though rarely a slight lymphocytosis occurs. Joy, sorrow, anxiety, wrath, jealousy, and sexual orgasm produced similar results. Such a leucocytosis was found also in a post-hypnotic "affect-dream." The changes were most marked in the emotional states unattended by motor or somatic phenomena. Strong affect in the waking state produced similar changes. In hypnosis injection of adrenaline produced less marked changes in the leucocyte count, blood-sugar, and blood pressure than normally. He considered the affect works as a sympathetic stimulant.

Joltrain (1917) associated emotional shock with anaphylactic shock and stated that in both these conditions there is leucopenia with relative mononucleosis, eosinophilia, hypotension, and shortening of the coagulation time. Widal had stated that these changes occur in the allergic diseases. Joltrain (1930) then postulated the existence of hæmoclasia in emotional shock, and produced evidence from many sources, of anaphylactic blood changes in mental states. Bath (1924), working on digestion, had shown previously that the leucocytosis in the peripheral blood could be caused by a vasomotor reflex, and could be as easily produced by the sight or taste of food, or by suggestion. In her view hæmoclasia probably had a similar explanation. She states that

* Work partly done during the tenure of a Grocers' Company Research Scholarship at St. Thomas's Hospital.

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the leucopenia or leucocytosis result from an altered distribution in the blood stream, not from a deformation of the blood picture. Pascal and Davesne (1925) suggested a diathesis, characterised by a syphilitic inheritance, a sensitising stimulus (physical or psychical trauma) early in life, and a tendency to react by anaphylactic shock in the form of anxiety or mental disease to the second stimulus. But Power and Pettit (1932) and also Yates and Batt (1932) showed that many of the formerly accepted results fell within the limits of experimental error, which had not been efficiently determined. Tinel (1933) found that excitement (maniacal or anxiety) produced a polymorph leucocytosis, while depression and stupor produced a leucopenia, particularly of polymorphs. He claimed that he could diagnose in the laboratory an anxiety state from agitated depression, because in the former there was "a polymorph leucocytosis with an eosinophilia and in the latter a leucopenia." Kasanin (1934), working with over 1500 unselected psychiatric patients, found leucocytosis of over 10,000 cells in 50 per cent. and over 15,000 cells in 14 per cent. and suggested from his data that overactivity, excitement, and tenseness was associated with high counts, and the reverse with normal counts.

There is evidence of a clinical syndrome of weakness, easy exhaustion and fatigue, associated with pronounced agranulocytosis (Roberts and Krache 1934). This is related to malignant neutropenia, in that some cases progress rapidly to ulceration of the throat, general infection, delirium, and death. Toil, worry, and prolonged mental effort appear to predispose to the condition, which is commonest in asthenic people. It is probably a type of agranulocytic angina.

INVESTIGATION

Anxiety states show changes most nearly comparable with those of anaphylactic shock. If, therefore, there is such a condition of hæmoclasia or psychic anaphylaxis, it is most likely to be found in these states. It was therefore decided to estimate the leucocyte counts, total and differential, the coagulation time, and the blood pressure in a series of persons exhibiting pathological anxiety and to compare

TABLE I—ANXIETY SYMPTOMS

Case No.	"Nerves."	Depression.	Head pains.	Palpitation.	Hot flushes.	Fear of crowds.	Fear of crossing streets	Inability to concentrate.	Bad dreams.	Insomnia.
1	+	..	+	..	..	..	+	..	..	..
2	..	+	..	..	..	..	..	+	..	..
3	..	..	+	+	..	..	..	..	+	+
4	+	..	..	..	..	+	..	..	..	..
5	..	+	..	..	..	..	+	..	..	..
6	..	..	+	..	+	..	..	..	..	..
7	..	..	+	..	..	+	..	..	..	..
8	..	..	+	..	+	..	..	..	..	+
9	..	..	+	..	..	..	..	..	..	..
10	..	..	+	..	..	..	..	..	..	..
11	..	+	+	..	..	..	..	..	+	..
12	..	..	+	+	+	..	..	..	..	..
13	+	..	..	..	..	..	..	..	..	..
14	+	..	..	..	+	+	+	..	..	..
15	+	..	+	..	+	+	..	+	..	..
16	+	..	..	..	+	..	..	+	..	..
17	..	..	+	+	..	..	+	..	..	..
18	+	..	+	..	+	+	..	..	..	..
19	..	..	..	+	+	+	..	..	..	..
20	..	..	..	..	+	+	..	..	..	..
21	+	+	+	..	..	..	..	..	+	+

these with a series of normal persons. In this investigation particular attention was paid to the method and to the accurate determination of experimental error. We hoped in this way to avoid conclusions which may have been too easily reached by others, and also to clarify the present state of confusion.

We studied 21 cases of typical anxiety state (Table I). Severe anxiety was present in all except two (Cases 3 and 11). Since Pascal and Davesne (1925) suggested that the provoking element for the blood changes was a psychical one, no provocative stimulus, such as milk was given. Having been instructed to eat a light breakfast at 9 A.M. and nothing else before visiting the hospital, each patient was seen between 2.30 and 3.30 P.M. on the day of

TABLE II

Case	Total whites.	Polymorphs (%).	Lymphocytes (%).	Eosinophils (%).	Basophils (%).	Large hyalines (%).	Blood pressure (mm. Hg).	Coagulation time (secs.).
1	6,805	58·25	39·25	1·0	0	1·5	139/95	129
2	8,260	68·25	27·25	1·75	0	3·25	130/68	123
3	5,307	59·5	35·5	2·75	0·25	0·75	120/72	149
4	13,610	60·0	33·5	5·25	0	1·25	98/80	144
5	11,321	74·0	23·5	1·25	0	1·25	140/92	134
6	9,651	56·5	37·25	5·75	0·25	0·25	118/80	111
7	10,037	59·0	34·0	2·75	0·5	4·25	140/70	119
8	8,004	65·25	33·0	1·0	0	1·25	145/85	122
9	10,132	54·5	42·75	1·0	0·25	1·5	128/82	135
10	8,738	74·25	21·0	3·25	0	1·5	138/70	109
11	5,207	49·5	47·0	2·0	0	1·5	120/80	137
12	7,533	60·5	36·25	1·75	0·5	1·0	135/88	116
13	8,838	60·75	35·75	0·25	0·25	3·0	118/68	123
14	9,045	63·75	32·5	2·0	0	1·75	142/80	145
15	6,720	63·0	31·0	2·25	0·25	3·5	140/92	116
16	2,525	35·5	60·25	1·0	0·25	3·0	128/78	118
17	9,573	60·25	35·5	0	0·25	4·0	122/80	120
18	7,961	50·25	45·25	0·25	0	3·5	138/92	109
19	8,111	71·25	26·25	0·75	0	1·65	104/82	118
20	6,142	66·5	29·75	1·25	0·5	2·0	130/72	116
21	10,037	63·75	32·5	0·5	0·5	2·75	138/78	114
			CONTROL CASES					
1	7,233	46·5	44·0	5·0	0·5	4·0	..	124
2	11,107	57·0	35·0	3·0	1·25	2·75	..	117
3	10,593	60·0	30·0	7·0	0·75	2·25	..	115
4	6,206	48·5	46·0	5·0	0·25	0·25	..	129
5	9,116	57·0	39·0	2·0	0	2·0	..	98
6	10,957	66·0	32·5	0·5	0	1·0	..	90
7	5,457	67·5	29·75	2·5	0	0·25	..	125
8	10,379	68·0	28·5	2·0	1	0·5	..	144
9	6,420	77·5	21·5	0·5	0·5	0	..	120
10	7,597	65·5	30·5	2·5	0·5	1·0	..	130

the experiment. Only the lightest work was ordered during the morning. By taking the blood at approximately the same time of day in every case it was hoped to reduce errors due to any spontaneous daily variations in the blood count. The blood for the leucocyte counts, total and differential, was taken from an antecubital vein, and that for the coagulation time from the finger pulp. The blood pressure was taken on at least three different occasions. On each occasion the systolic pressure was taken as the lowest reading obtained after filling and emptying the bag slowly four times; the diastolic pressure was then recorded. The figures given in Table II represent the lowest readings obtained in each case.

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Method of counting.—For the total white cell count, an automatic blood-diluting pipette was used (Piney 1924). This minimises instrumental error, but requires three times as much blood as the Thoma-Zeiss pipette. Hence the necessity for venepuncture. The dilution factor of the pipette was checked by weighing its distilled water content, and was found to be 10·26. The Türk hæmocytometer was used, and the contents of 120 squares were counted.

Standard deviation.—The following formula is used :—

$$\text{Standard deviation} = \sqrt{\frac{\Sigma d^2}{N-1}}$$

Where Σd^2 is sum of the squares of the deviations from the mean, and $N-1$ is the number of varying observations where one of the series is fixed.

We counted 120 squares because a significant difference is one of over 26·2 per cent., while when only 40 squares are counted a significant difference must be over 35·2 per cent. The differential white cell counts were done on two films made from venous blood, stained with Leishman's stain. On each film 200 cells were counted—i.e., 400 in all. In calculating the standard deviation for this method 800 cells were counted. In the case of polymorphs the standard deviation for 100 cells counted was 11·8 per cent. and with 400 cells counted 0 per cent.; for lymphocytes 13·9 per cent. with 100 cells counted and 3·1 per cent. with 400 cells.

A significant difference for lymphocytes is therefore one of over 6·2 per cent. and although the polymorphs gave no deviation from the mean, one must assume a similar latitude for them. In support of this is the fact that, since the distribution is a binomial one, the standard deviation can be taken as 5 per cent. if the true proportion of polymorphs is between 40 and 60 per cent.

Coagulation time.—This was determined by the capillary tube and lead shot method of Dale and Laidlaw (1912), the tube being immersed in a bath at 37° C. Repeated readings were taken till two were obtained agreeing to within 5 sec. The mean of these two were taken. Readings of this degree of constancy were usually obtained after one or two trials. Using this method on eight persons, Dale and Laidlaw found that the normal coagulation time is 105 ± 5 sec. Our 10 control cases gave a mean of 119 sec., and a standard deviation of 13·2 per cent. A significant difference is therefore one of more than 26·4 per cent.

RESULTS

Of the 21 cases, 10 were women, 11 men. Table I gives the incidence of chief complaints.

Allergy.—The incidence of possible allergic conditions was as follows :—

5 patients (Cases 5, 10, 14, 19, and 20) had had urticaria, 5 (Cases 5, 9, 11, 13, and 21) food upsets suggestive of allergy, 4 (Cases 2, 9, 10, and 13) definite migraine, and 2 (Cases 11 and 13) had had pruritus.

None of our patients had had asthma or hay-fever.

Blood pressures.—The average blood pressure for the series was 129 mm. Hg systolic and 80 mm. diastolic. Considering the wide distribution of ages this is remarkably normal.

In Cases 1, 5, 7, 8, 10, 14, 15, and 21 the systolic pressure was high, and in Cases 4 and 19 low. When taking the systolic pressure four times in succession the fourth reading was on an average 2–8 mm. lower than the first reading, and on different occasions the variation was as much as 10 mm. The diastolic pressures were fairly constant, varying only 5 mm. on different occasions.

These findings are in disagreement with those of Brasher (1932) who found both systolic and diastolic pressures persistently low in anxiety states. He quotes only 5 cases. Barton Hall (1927) on the other hand found the blood pressure persistently high in anxiety states, with a tendency to fall during treatment. Our findings are in agreement with his statement that the pressure is sensitive and labile, rising quickly on minor emotional stimulation.

Leucocyte picture.—Table II shows the total and differential white counts, the blood pressures, and coagulation times in the 21 cases. With the exception of Case 16, the leucocyte counts fall within the normal range.

The mean total leucocyte count for the 10 controls was 8476 cells and for the anxiety cases, 8217 cells; a significant difference would have to be one of ± 26·2 per cent. (or ± 2200 cells). The polymorph and lymphocyte counts fall within normal limits. The mean polymorph count for the controls was 61·5 cells and the anxiety cases 60·7 cells. The mean lymphocyte counts for the controls was 34·8 cells and for the anxiety cases 33·7 cells. In the case of the eosinophils the difference of the means divided by the probable error of the means equals 3·75 which is not significant. The mean coagulation time for the controls was 119 sec., and for the anxiety cases 125 sec.

CASE 16.—This man, who was aged 41, showed a persistent leucopenia, chiefly of polymorphonuclear cells. He was admitted to St. Thomas's Hospital under the care of Dr. Henry Yellowlees for full investigation. Apart from a few discrete soft glands in the supraclavicular fossæ, no physical abnormality was discovered. His mouth and throat remained in good condition during five months' observation. Table III gives the results of his blood examinations.

TABLE III

Date.	Leucocytes.	Polymorphs.	Lymphocytes.	Eosinophils.	Large hyalines.
Nov. 21st	2523	36	60	1	3
Nov. 25th	1160	27	53	1	18
Dec. 12th	3280	35	45	0	20
Dec. 30th	2600	29	59	0	11
April 14th	1670	35	37	3	25

He was given 9 injections of 10 c.cm. of Pentnucleotide while in hospital. A small rise in his total leucocyte count occurred. He was treated by a course of psychotherapy during which both maladjustments in childhood and environmental difficulties in his home and business were discovered. He reacted satisfactorily and within seven weeks had lost his anxiety symptoms, although his blood picture remained unaltered.

We have recorded this case separately because of the rarity of symptomless leucopenia and because in this case it appeared to be definitely unrelated to the psychoneurosis.

SUMMARY AND CONCLUSIONS

1. The leucocyte counts, total and differential, the coagulation times, and blood pressures have been recorded in 21 cases suffering from anxiety states. The method of estimation has been subjected to statistical evaluation.

2. With the exception of one case, the series show leucocyte counts and coagulation times falling within normal limits.

3. A case has been reported of persistent leucopenia with inversion of the polymorph-lymphocyte ratio and normal coagulation time. This was however unrelated to the anxiety state and remained unchanged after the last symptoms of the neurosis had disappeared.

4. The blood pressure was found to be labile and sensitive in these cases, but was neither raised nor lowered in the series as a whole.

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We wish to thank Dr. Henry Yellowlees and the staff of the psychiatric department of St. Thomas's Hospital for supplying the case material and for advice in diagnosis.

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ADULT SCURVY ASSOCIATED WITH VITAMIN-B_1 DEFICIENCY

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IT is now recognised that dyspeptic people who adhere for long periods to special diets may suffer from deficiency of vitamins. Cases of this kind are described by Archer and Graham (1936), Platt (1936), Hawksley (1938), and others. Poverty is another common cause of faulty diets, but ignorance of food values may cause even the well-to-do to suffer from vitamin deficiency. The following case illustrates the importance of inquiry into the composition of the diet in all patients irrespective of social position.

CASE-HISTORY

The patient, a man of 26, was seen on August 15th, 1934. He had had no serious illnesses and up to five weeks previously had been in his usual health. He first noticed stiffness of the left leg on walking, and shortly afterwards dyspnœa on effort. Then the left leg became swollen, but he continued to get about in spite of the dyspnœa and the lameness of the left leg. About a week later the right leg swelled, but he paid no attention. His appetite and digestion remained unchanged, but members of the household noticed he had become very pale and short of breath. He steadfastly refused to see a doctor.

From the time of leaving school the patient had been increasingly reserved and shy. He made no friends and shunned the company of his fellows and even that of his own family. For a considerable time past he had taken all his meals alone in his own room, where he spent all his time, reading and writing. He was a heavy cigarette-smoker, but took no alcohol. He did not believe in open windows, but once a day went out for a solitary walk, this regular walk being the only break in his unhealthy existence. In spite of increasing dyspnœa and œdema he refused to take to bed, and did so only when unable to get about. Even then he was not seen by his doctor until the day before I was called in.

He was then gravely ill; he was very dyspnœic on attempting to move in bed, and appeared to be moribund, so that clinical examination had of necessity to be limited. A high degree of anæmia was indicated by blanching of the conjunctival mucous membranes. The face was very pale but the lips were cyanosed; the pulse was regular, rapid, and feeble. The heart sounds were of very poor quality and the apex-beat impalpable. A systolic bruit heard over the precordium was taken, in association with the other signs, to indicate a dilatation of the heart as a whole. In front the lungs presented no gross physical signs. The abdomen was distended, palpation suggesting the presence of free fluid, although a fluid thrill was not elicited. The liver was swollen and the edge palpable 3 in. below the costal margin. The spleen was not felt.

On turning down the bed-clothes the lower limbs, from feet to groins, were seen to be œdematous to a remarkable degree, each limb being distended with fluid to its utmost capacity; the scrotum was not involved. Huge hæmorrhages had taken place into both thighs, making them brawny and indurated, the skin in these regions presenting all the colour changes associated with extravasated blood. Pitting on pressure was very slow. There was also evidence of large hæmorrhages in and under the skin about the ankles; here too were numerous petechial hæmorrhages, largely confluent, in the natural lines of the skin between the malleoli. The fundi were free from hæmorrhages and the tonsils showed no exudate. As the patient was of good social position and was said to be "taking his food well," an avitaminosis was not suspected. It was feared that he would prove to be a case of leukæmia.

On transfer to the Insull wing of the National Temperance Hospital, next morning, a blood count showed:—

Red cells	2,060,000	Polymorphs	60%
White cells	6,700	Eosinophils	1%
Hæmoglobin	20%	Basophils	0%
Colour-index	0·5	Lymphocytes	36%
Platelets	320,000	Large mononuclears	3%

Anisocytosis and poikilocytosis present.

In the light of this information details were sought from the friends as to what "taking his food well" meant. It was then learned that his habits in regard to diet were eccentric in the extreme. He did not share the meals eaten by the other members of the household, but was accustomed to fix a diet for himself, and having done so, adhere to it daily without variation for months on end. When he eventually tired of his set daily menu another would be substituted, and like the previous one this would be eaten for months at a time before another change was made. For about two years he had not eaten any fresh fruit or green vegetables, but up to six months before his illness had had potatoes every day in the form of shepherd's pie. Tinned fruit was eaten regularly. The daily diet for the past six months had been as follows:—

9.30 A.M.: Cup of coffee with sugar and a little milk.
1 P.M.: Welsh rabbit, coffee, toast, tinned pears.
3.30 P.M.: Cup of tea with sugar and milk; hot crumpets and butter.
5 P.M.: Plate of baked beans (tinned); coffee.
8 P.M.: Currant buns without butter; coffee; tinned pears.

A second inspection of the mouth showed that the teeth were in fairly good condition, only slight dental caries being present. The teeth were not loose. The gums were pale and slightly swollen, especially in the lower jaw around the incisor teeth, but did not bleed on being touched. Hæmorrhages were absent except in the gum around the last two molar teeth in the upper right jaw. As the blood count had excluded thrombocytopenia as well as leukæmia, the patient was now regarded as suffering from an avitaminosis.

The slightest attempt to move in bed brought on dyspnœa, and had the anæmia been less severe a venesection would have seemed appropriate. The hæmoglobin was, however, only 20 per cent., and although the risks of adding to the load on the right heart were fully appreciated, it was decided to give a small blood transfusion. This was performed

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by Mr. R. A. Kerr, 250 c.cm. of citrated blood being run in extremely slowly, while a careful watch was kept on the patient's pulse. During this operation no symptoms of distress arose, but on the contrary the pulse and general condition improved, and at the end the patient said he felt better.

Progress in hospital.—The patient was in hospital a fortnight, during which time the urine contained no albumin or blood, and the stools were negative for occult blood. On the evening of the fourth day the temperature rose to 99·6° F. but otherwise remained normal. The pulse-rate was always rapid, but dropped from 128 on admission to 90 on discharge. Respirations averaged 22.

The dietetic and medicinal treatment was :—

(1) Undiluted orange juice, a tumblerful three times a day.
(2) Extract of malt with cod-liver oil, a teaspoonful three times daily.
(3) Marmite, a teaspoonful daily.
(4) Bemax, a tablespoonful daily.
(5) Kapsol Iron with Copper (A. & H.), six daily.
(6) A mixed diet, including fresh fruit, green vegetables, cereals, eggs, lightly cooked meat, and minced raw liver flavoured with lemon juice.

The patient ate well, no digestive disturbances were experienced, and his progress was remarkably rapid. Two days after admission to hospital a blood count showed :—

Red cells ..	2,115,000	Polymorphs..	73%
White cells ..	4,400	Eosinophils ..	4%
Hb... ..	42%	Basophils ..	0%
C.I... ..	1·0	Lymphocytes ..	18%
		Large mononuclears	4%

Five normoblasts seen while counting 100 leucocytes. Anisocytosis present.

Four days later the count was :—

Red cells ..	2,800,000	Polymorphs..	35·5%
White cells ..	4,400	Eosinophils ..	3·5%
Hb... ..	66%	Basophils ..	0·5%
C.I... ..	1·2	Lymphocytes ..	56·5%
		Large mononuclears	4·0%

Three normoblasts seen while counting 200 leucocytes.

On the day before discharge the blood picture was :—

Red cells ..	4,210,000	Polymorphs ..	52%
White cells ..	6,400	Eosinophils ..	0%
Hb... ..	80%	Basophils ..	2%
		Lymphocytes ..	43%
		Large mononuclears..	3%

No nucleated red cells.

Improvement in the patient's general condition was in keeping with the rapid regeneration of the blood, and each day he looked and felt better. By the end of a week most of the œdema had subsided; the liver was no longer palpable, on clinical examination the heart had returned to normal size, and the systolic bruit had gone. The blood pressure was 140/74. The patient could move his legs in bed without dyspnœa and complained only of stiffness in the ankle-joints—probably the result of hæmorrhages into the joint cavities. When he was first seen the patient's general nutrition had seemed to be fairly well maintained and a subsidence of the œdema confirmed the absence of obvious wasting. On discharge there was no œdema, but the heart was still rapid, although the sounds were of fair quality and the rhythm regular. No petechial hæmorrhages were present, but the skin of the legs, especially in the thighs, popliteal fossæ, and ankles, was still discoloured from the larger hæmorrhages. The gums and teeth appeared normal. On trying to walk the patient found all his leg joints very stiff. The tendon reflexes were markedly exaggerated but sensory disturbances were absent. When one considers that a fortnight before this he appeared to be on the brink of the grave, his degree of recovery seemed nothing short of miraculous.

Subsequent progress.—The patient was seen again two and a half months later. In the meantime he had been taking a mixed diet, and stated that shortly after leaving hospital all disability on walking had disappeared. He looked well, had gained weight, and said he felt perfectly well. There was no dyspnœa. The heart did not appear to be enlarged, the sounds were of good quality, no murmurs were present, and the blood pressure was 130/95. The rhythm was grossly irregular and the rate only 42. During this examination the patient was in a highly emotional state and the irregularity was ascribed to over-stimulation of the vagus. All the tendon reflexes were grossly exaggerated.

When he was seen again three weeks later the rhythm was regular and the rate 96. The heart sounds were of good quality and the blood pressure 145/90. The patient pronounced himself cured and said he would come for no more medical examinations, but yielded to persuasion in the matter of further blood counts. A note of these subsequent to leaving hospital is appended :—

RESULTS OF SUBSEQUENT BLOOD COUNTS

Date.	Red cells. (per c.mm.).	White cells. (per c.mm.).	Hb. (%).	Colour-index.
Sept. 6th, 1934 ..	4,400,000	7,800	104	1·18
Oct. 16th „ ..	6,070,000	10,300	112–114	—
Nov. 15th „ ..	6,930,000	7,600	134	—
Dec. 4th „ ..	5,570,000	9,400	118	—
Jan. 1st, 1935 ..	6,210,000	9,400	114	—
March 5th „ ..	5,430,000	10,900	112	—
June 4th „ ..	5,990,000	8,600	104	—

No further blood examinations were made, as the patient could not be induced to return, and at the time of writing (May, 1938) his physical condition is said to be good.

COMMENTARY

The blood changes.—Parsons (1938) states that after large hæmorrhages have resulted in a post-hæmorrhagic anæmia, the anæmia of scurvy becomes hypochromic, but in the absence of severe bleeding the anæmia is usually orthochromic and normocytic, and at times may be macrocytic. In the case under review a severe hypochromic anæmia was rapidly succeeded by an orthochromic and even slightly hyperchromic condition. At the end of ten weeks a definite, though moderate, polycythæmia was present, and even eleven months after the patient was first seen the red cells still numbered 6,000,000 per c.mm. Excessive output of erythrocytes in convalescence produced at one stage a red cell count of 6,930,000 and a hæmoglobin of 134 per cent. Similar changes in the blood of convalescents from scurvy have been recorded by Hess (1920) and others. The white cell counts in the present case showed no notable changes at any time, such variations as were observed being within normal limits.

Gums.—In classical examples of scurvy, hæmorrhagic gingivitis is one of the characteristic signs, except in edentulous patients. Implication of the gums may be an early or a late manifestation. In the case now described the changes in the gums were slight, hæmorrhagic gingivitis being confined to one small patch. In view of the severity of the other manifestations—extensive hæmorrhages in the legs, extreme anæmia, and myocardial failure—such slight involvement of the gums would be unusual in a case of scurvy.

Myocardial failure and œdema.—The severity of the myocardial failure and œdema provided another

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variation from the classical picture of scurvy in which, as a rule, evidences of cardiac involvement are confined to dyspnœa and slight œdema of the feet and ankles. Indeed in many cases dyspnœa is not experienced and œdema is absent. A number of factors, however, might contribute towards more marked myocardial weakness in certain cases of scurvy, as for example advancing years, pre-existing disease of the heart, and physical overstrain. My patient was a young man with no previous cardiac disability, and although he continued to get about the house in spite of dyspnœa and œdema, the exercise involved was very slight. Other factors likely to increase the cardiac symptoms in scurvy would be neglect of treatment in the early stages, a severe associated anæmia, and possibly a marked imbalance between the fat, protein, carbohydrate, and salts of the dietary. Regarding the latter, there is no positive evidence that imbalance between the nutritive constituents of the diet results in œdema, although one ætiological factor in war œdema was thought to be deficiency of protein in the plasma. The patient was extremely anæmic when first seen, but the œdema had been present for a month previously, and it is unlikely that the degree of anæmia was then comparable to that which existed when treatment was begun. Further, the patient stated that his legs were greatly swollen long before any hæmorrhages were visible on the skin. Although some of the factors mentioned above may have contributed to the œdema, it is clear that the heart dilated at an early stage in the illness and the cardiac manifestations were therefore quite disproportionate to those commonly seen in cases of scurvy.

The *diet* consisted of white bread; small quantities of milk; cooked cheese and butter (some of the butter was cooked with the cheese to make welsh rabbit, and part was taken uncooked with toast); tinned pears; and canned (cooked) beans. The makers of the last product stated that the process of canning did not involve destruction of vitamin C, but they were unable to say whether or not vitamin B_1 was preserved. The diet was particularly poor in every way; as regards vitamin-content there appears to have been a deficiency of vitamin B_1 as great as, if not greater than, that of vitamin C.

Diagnosis.—Both scurvy and beri-beri are thought to develop more readily on vitamin-deficient diets in which the carbohydrate fraction is greatly in excess, as in the above diet. A diet giving rise to symptoms of deficiency may, of course, be deficient in more than one vitamin, as in the present case. The blood changes and hæmorrhages in the lower limbs were typical of scurvy; but the changes in the gums were very slight, and the cardiac manifestations—occurring early and associated with great œdema—were more in accord with the wet form of beri-beri. A syndrome resembling the description of Rand scurvy was thus presented. In this condition cardiac symptoms are severe, gingivitis is slight or absent, and the knee-jerks are exaggerated. As regards the knee-jerks in my patient, however, one could form no definite opinion, for he was very nervous and though the exaggerated tendon reflexes might have been due to vitamin-B_1 deficiency, they may have been functional in origin. Darling (1914) has shown that the post-mortem appearances of the heart in Rand scurvy are similar to those of the beri-beri heart, and there can be little doubt that Rand scurvy results from combined B_1 and C deficiencies. The so-called "ship beri-beri" is another syndrome probably due to associated B_1 and C deprivation. I suggest that the patient's illness was of the same category.

SUMMARY

A young man chose to live on a very poor diet notably deficient in vitamins B_1 and C. He developed cardiac failure, with gross œdema of the lower extremities, followed by the appearance of hæmorrhages in the legs. There was severe anæmia and blood changes typical of scurvy, though the gums were little affected. It is suggested that the syndrome present was an expression of combined B_1 and C deficiencies, the cardiac manifestations being due essentially to deprivation of the former vitamin, the anæmia and hæmorrhages to an associated scorbutic state. Treatment included a balanced dietary with large doses of the vitamin-B complex by mouth, orange juice, and cod-liver oil. Under this régime recovery was very rapid.

I should like to express my thanks to Dr. Harold H. Sanguinetti, pathologist to the National Temperance Hospital, for his kindness in doing numerous blood counts, and to Mr. R. A. Kerr, surgeon to the hospital, for performing the blood transfusion.

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BLOOD TRANSFUSION WITH HEPARIN

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HEPARIN, the natural inhibitor of blood coagulation, was discovered in the liver by Jay McLean in 1916 and first accurately investigated by Howell and Holt (1918). Later, it was also found in other organs, such as muscle and lungs. Jorpes (1935a and b, 1936a and b, 1937), Charles and Scott (1933, 1935, 1936), and Fischer and Schmitz (1932, 1933a and b, 1935) have thrown light upon the chemical composition of this compound, which contains a nitrogenous carbohydrate derivative (mucoitin), of which the important constituent is sulphuric acid combined as an ester (up to 35 per cent. SO_4). In experiments in vitro the inhibiting action of different heparin preparations on blood coagulation is approximately parallel to their content of sulphuric ester.

The mechanism of the inhibition of blood coagulation by heparin is not yet clear (Clemens 1938). Howell (1918, 1922, 1928) considers that it is an antiprothrombin; Ferguson (1937), Quick (1936, 1937) and Lenggenhager (1936) describe it as an antithrombogen, from which a highly active antithrombin having the property of combining with and inactivating thrombin is produced by reaction with a constituent of serum albumin.

Heparin has two important applications in medicine, first in simplifying the technique of blood transfusion and secondly in the prophylaxis and treatment of thrombosis. Its therapeutic possibilities were discussed in a leading article in THE LANCET of March 19th, 1938, and by Lenggenhager (1936), Crafoord (1937), Clemens (1938), Murray and Best (1938), Magnusson (1938), and Holmin and Ploman (1938). We have used heparin in the treatment of thrombosis in our clinic, but the results have been inconclusive and we do not propose to deal with them here.

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Howell and Holt (1918) were the first to employ heparin in blood transfusion, but the impurities in their preparations caused difficulties, as was also observed by Clemens (1938). Sköld (1936) transfused blood to which heparin had been added in vitro, but noted no increase in the coagulation-time of the blood of the recipient. Hedenius (1937) went a step further and reports on over 150 transfusions. He injected 200 inhibiting units per kg. body-weight into the donor within half an hour of carrying out the transfusion. There is no danger of prolonging bleeding in the recipient by this procedure because he only receives at most 50 inhibiting units per kg., a quantity which is completely safe (Bergström, Jorpes, and Wilander 1937).

For some time we have been investigating the problem of blood transfusion with heparin preparations after satisfying ourselves of their safety by preliminary experiments. There are various important objections to the use of sodium citrate and it is obviously advantageous to use instead a physiological inhibitor of blood clotting. We were also interested in the possibility of simplifying the technique of transfusion by the use of heparin to such an extent that it could easily be carried out by a general practitioner without special apparatus and an experienced staff. The method of Hedenius (1937) seemed to us most promising because it can be carried out by a single person and because it was found that the blood can be transported in unwaxed glass vessels. There still remains the problem of suitably storing the blood to be transfused, so that a suitable donor would not need to be present.

We used two heparin preparations supplied by Messrs. Hoffmann-La Roche (Basle):

(*a*) A preparation in 5 c.cm. glass ampoules of 7500 inhibiting units, sterilised but not completely free from other substances.

(*b*) A pure heparin in 5 c.cm. rubber-capped bottles of 20,000 inhibiting units. The use of these bottles was particularly useful when only small quantities of heparin were needed.

INHIBITION OF COAGULATION IN VITRO

To samples of 10 c.cm. of human blood, some in paraffined and some in unparaffined test-tubes, 20, 30, 40, 60, 80, and 100 inhibiting units of heparin were added. After various periods the state of the blood was tested with a glass rod. The same blood without heparin was used for comparison.

The time of coagulation was found to be increased approximately in proportion to the amount of heparin added. In unparaffined glass the blood remained uncoagulated for an average of 75–100 min. when 1000 inhibiting units per 100 c.cm. was used (minimum 45 min., maximum 60 hours). A delay of coagulation of 45 min. should be quite sufficient for blood transfusions, even under difficult circumstances. The blood remained uncoagulated 3–5 times as long in paraffined glass, so that the dose of heparin can be kept definitely lower by the use of paraffined instruments during the transfusion.

We carried out a series of transfusions in which the blood withdrawn in the Merke apparatus was treated with 1000 inhibiting units of heparin per 100 c.cm., the heparin being diluted with saline to 20 c.cm., mixed, and injected. All of the transfusions of 150–500 c.cm. of blood carried out in this manner, some with paraffined, others with unparaffined, Merke containers, were completely successful and free from complications. No case of shock or even of slight discomfort was observed and the coagulation-time of the recipient was never increased.

INHIBITION OF COAGULATION BY INJECTION OF HEPARIN

The sole advantage which the above method possesses over the citrate method is that paraffined vessels can be dispensed with. We therefore turned to the method of Hedenius (1937) of heparinising the donor.

We determined the coagulation-time of our patients 15–30 min. after the intravenous injection of increasing doses (measured by inhibiting units) of heparin, the doses being diluted with saline to 20 c.cm. in order to ensure a slow and regular injection taking about 5 min. With the preparation which contained some impurity symptoms resembling shock followed the injections, but these were not seen with the pure heparin. During and some time after the injection we recorded the temperature, pulse-rate, and blood pressure of the patients, all of which remained unchanged. One man, aged 20, received 30,000 inhibiting units of the undiluted heparin solution in error and a pronounced urticaria appeared on his face about 10 min. afterwards and later spread over his whole body. The man complained of nausea and of feeling hot in the head. He was given calcium intravenously and the urticaria and headache lessened considerably in half an hour and there were no further symptoms.

In this experiment we used Bürker's method of determining the coagulation-time as being more rapid and accurate than the test-tube method described above. Naegeli (1931) describes the method as follows:

> One drop of boiled distilled water is placed on a hollowed slide in a thermostat at 25° C. and one drop of blood from a pin-prick in the tip of the finger is allowed to drop in and is mixed by a clean glass rod. Every half minute the glass rod is passed in a different direction through the drop until the first "thread" is formed.

Bürker (1912) found that the normal coagulation-time was 5 to 5½ min.; our values varied from 3½ to 6 min. We were unable to find the cause of this difference, which did not however have much effect on the evaluation of our results. Unfortunately an absolutely accurate method is not yet available.

After determining the normal coagulation-time we injected heparin into our patients using at first 1500 inhibiting units and increasing to 40,000. The coagulation-time was then estimated 15 min. after completion of the injection, again after a further 15 min., and subsequently at intervals of 30 min. The results are given graphically (see Figure). Each curve shows the mean value of the experiments on different patients with the same dose of heparin.

This experiment showed that doses of 1500 inhibiting units increased the coagulation-time and this increase was almost doubled by using 20,000 units and about trebled by using 40,000 units. The maximum effect was attained 15 to 30 min. after the injection; there was always a fall 90 min. after the injection and after 2½ hours normal values were again reached in every case. The increase of the coagulation-time was small in comparison with that observed in vitro.

Large doses of heparin must be used when the donor is being heparinised because lesser amounts will not delay the coagulation sufficiently. In carrying out several transfusions by this method we observed that blood taken in larger quantities remained uncoagulated much longer than that taken in drops for estimation. Even when only 20 c.cm. of blood was taken, the same phenomenon was

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observed. In a transfusion interrupted because of a defect in the tubing, it was 45 min. before the blood in the needle coagulated. In our opinion the prospects of this method are promising, but many more facts are required and the present lack of any exact standard is unsatisfactory.

In none of the transfusions were there any disturbances in the recipient, and in particular no increase in his coagulation-time, so that this method would seem suitable where the recipient is subject to the likelihood of increased bleeding (bleeders, leukæmia, &c.).

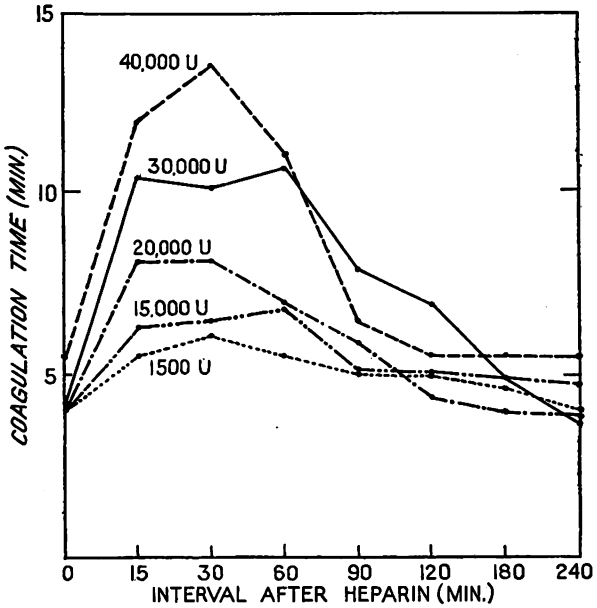

Figure showing effect on coagulation-time of various doses of heparin and duration of effect.

We have observed no symptoms in the donor, except the case of urticaria described. The donor's blood will have an increased coagulation-time for 2 hours after the withdrawal of blood and he should be careful during this time.

SUMMARY

Experiments are described in which the delaying action of heparin on the coagulation of blood in vitro and in man is investigated, particularly with a view to simplifying the method of blood transfusion.

By adding heparin to the blood after withdrawal or by injecting it into the donor before transfusion a sufficient delay in coagulation can be achieved to enable a successful transfusion to be carried out. The problem of controlling the delay of coagulation requires further investigation.

Heparinisation of the donor has no ill effects on him or on the recipient The method is carried out as follows: heparin is injected into the donor, the blood is withdrawn after some minutes and collected in an unparaffined syringe or bottle and directly injected into the recipient. This method makes it possible to carry out a transfusion without special operative procedures, apparatus, or trained staff, since all that is necessary is a venous puncture.

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BIOLOGICAL EFFECTS OF THE SYNTHETIC ŒSTROGENIC SUBSTANCE 4 : 4′-DIHYDROXY-α : β-DIETHYLSTILBENE

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THE œstrogenic activity of the synthetic compound 4 : 4′-dihydroxy-α : β-diethylstilbene (diethylstilbœstrol) has been described by Dodds, Golberg, Lawson, and Robinson (1938). When tested on ovariectomised rats as low a dose as 0·35 μg. in sesame oil gave vaginal œstrus response in 60 per cent. of animals, also 1·0 μg. in oil orally produced œstrus in 80 per cent. of animals. Numerous actions other than vaginal keratinisation have been described for the natural œstrogens and may be used as methods of assay. A series of preliminary observations have been made to determine whether the action of diethylstilbœstrol is similar in all respects to the natural œstrogens.

Action on uterus.—Virgin white Wistar rats were ovariectomised at approximately 175 g. in weight. Ten days after this operation the animals received total doses of 1, 50, and 200 μg. of diethylstilbœstrol. The active substance was dissolved in sesame oil and administered by twice daily, subcutaneous injections for three days. The animals all showed a vaginal smear typical of full œstrus by the fourth

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FIG. 1 A B C

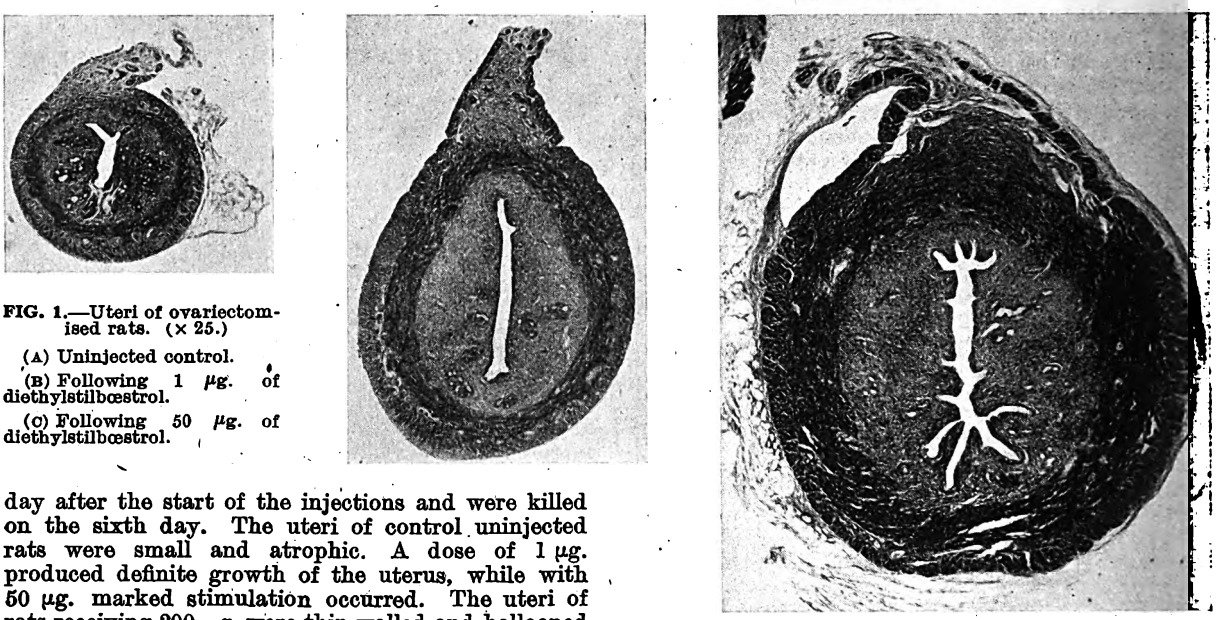

FIG. 1.—Uteri of ovariectomised rats. (× 25.)

(A) Uninjected control.

(B) Following 1 μg. of diethylstilbœstrol.

(C) Following 50 μg. of diethylstilbœstrol.

day after the start of the injections and were killed on the sixth day. The uteri of control uninjected rats were small and atrophic. A dose of 1 μg. produced definite growth of the uterus, while with 50 μg. marked stimulation occurred. The uteri of rats receiving 200 μg. were thin-walled and ballooned out with fluid. In Fig. 1 the effect of 1 μg. and 50 μg. on the uterus may be compared with the control.

Mating.—When ovariectomised animals given the above dosage were placed with normal male rats mating with vaginal plug occurred in the rats receiving 200 μg., but not in the 1 or 50 μg. doses.

Vaginal œstrus.—To compare the relative potency of this synthetic substance with œstrone a group of 60 primed ovariectomised rats were used for assay. The substances were made up in alcohol-aqueous solutions, the number and spacing of doses being as previously described. In these experiments it was found that 0·25 μg. of diethylstilbœstrol produced the same response as 0·60 μg. of œstrone. The synthetic substance therefore appears to be approximately 2½ times as potent as œstrone under these conditions. The duration of vaginal œstrus with a dose of 1 μg. in oil was from 3 to 5 days. Doses of 5–10 μg. produced an œstrus for from 5 to 8 days while with 50–200 μg. the rats remained in œstrous from 12 to 18 days.

Immature rats.—Female rats, 28 days old, were found to respond in a similar manner to the ovariectomised adults. Opening of the vagina occurred with the smallest dose tested—0·5 μg. per rat. Larger doses caused typical enlargement and distension of the uterus.

Immature rabbit uterus.—The ability of this compound to sensitise the uterus to progesterone was tested, using the immature rabbit (McPhail 1934). 100 μg. of this substance given over ten days and followed by 2 rabbit units of progesterone gave typical uterine proliferation.

Mammary growth.—Immature guinea-pigs of approximately 200 g. weight received subcutaneous injections of the oil solutions daily for three weeks. In both male and female animals stimulation of nipple growth was produced, the nipples of the

FIG. 2 A B

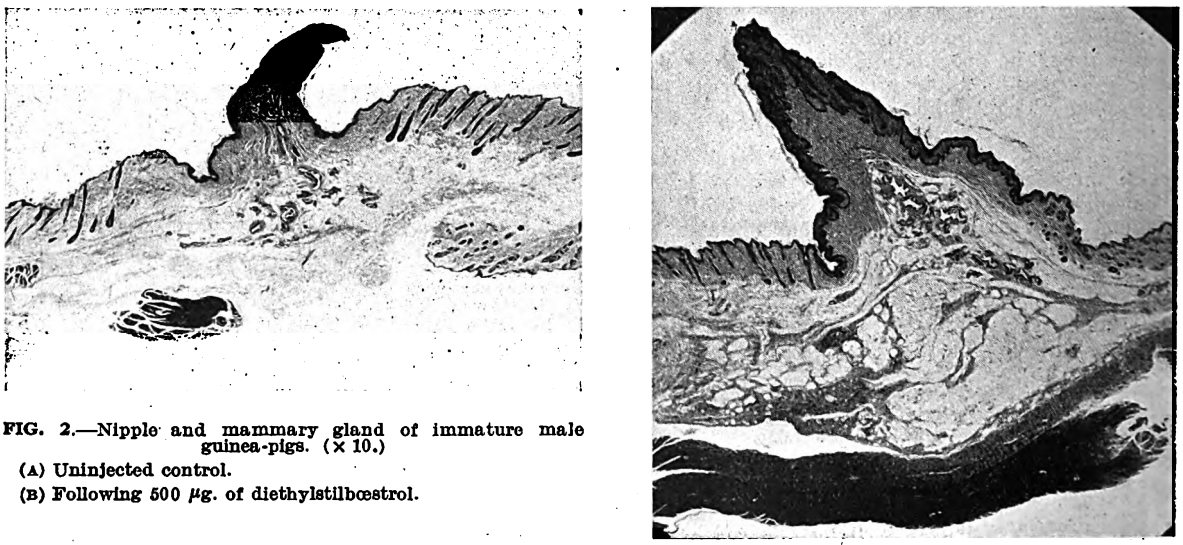

FIG. 2.—Nipple and mammary gland of immature male guinea-pigs. (× 10.)

(A) Uninjected control.

(B) Following 500 μg. of diethylstilbœstrol.

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injected animals being 3 to 4 times larger than uninjected controls and similar to equivalent doses of œstrone. In Fig. 2 the stimulation produced by 0·5 mg. of the synthetic substance in a male guinea-pig may be compared with a normal control. Development of the mammary gland is produced by diethylstilbœstrol, but from preliminary experiments it would appear that this is much less than that following similar amounts by weight of œstrone. In male animals the mammary development produced by 200 μg. of œstrone is apparently greater than that following 500 μg. of the synthetic substance. Judging from the relative activity obtained by vaginal œstrus assay it suggests that the synthetic substance is only one-fifth as active as œstrone in producing proliferation of mammary tissue yet equally efficacious in causing growth of the nipple. Further experiments are in progress to verify this inexplicable observation, but because of the difficulty in quantitatively estimating mammary development a large series of animals must be considered before a definite conclusion can be reached. In another series of experiments (to be reported separately) very large doses of diethylstilbœstrol have produced full mammary growth and milk formation in female rats.

Capons.—Dr. A. W. Greenwood at the Institute of Animal Genetics, Edinburgh, has found feminising changes in the feathers of the brown leghorn capons following the administration of the synthetic substance. This response was similar to that produced by œstrone.

SUMMARY

The synthetic œstrogenic substance 4 : 4′-dihydroxy-α : β-diethylstilbene has been found to have an action similar to œstrone on the uterus of ovariectomised rats, on the mating reaction, vagina, and uterus of immature rats, on the uterus of immature rabbits, and on the feathers of capons.

By vaginal-smear assay on ovariectomised rats under the conditions described the synthetic substance was approximately 2½ times as active as œstrone.

Nipple growth in the guinea-pig was produced, similar to that caused by œstrone. Preliminary observations indicate that the synthetic substance has appreciably less stimulating action on the mammary tissue than œstrone.

The sections were prepared in the Bland-Sutton institute of pathology, Middlesex Hospital, through the courtesy of the director.

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CASE OF MASSIVE PNEUMONIA, TYPE III, WITH MASSIVE COLLAPSE, TREATED WITH 2-(*p*-AMINOBENZENESULPHONAMIDO) PYRIDINE

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A. B., a healthy well-preserved old lady of 65, was admitted to St. Bartholomew's Hospital on May 3rd, 1938, under the care of Dr. John Barris with a two years' history of prolapse. Apart from pneumonia at the age of 12 and the removal of an ovarian cyst 14 years later, she had always enjoyed excellent health. No abnormality other than cystocele and rectocele was found on examination; her blood pressure was 180/108. Operation was delayed for a few days.

THE ILLNESS

At 2 A.M. on *May 8th* she suddenly complained of pain in the left lower chest, the temperature rose to 103° F. and she had a slight rigor. Next day signs of consolidation had appeared in the left upper lobe, the sputum was blood-stained and the leucocyte count 13,400; she was seen by Dr. George Graham and transferred to his care.

May 10th.—The heart and mediastinum were found to be displaced to the left, suggesting extensive collapse of the left lung—this was confirmed by radiography (Fig. 1). Meanwhile a pure culture of pneumococcus, Type III, had been recovered from the sputum. There was no cyanosis and the patient's condition was relatively good; temperature 101°–102° F., pulse-rate 100, respirations 30. It was therefore decided that bronchoscopy should be undertaken in the hope of relieving the collapse of the left lung. This was done forthwith under Pentothal anæsthesia by Mr. Bedford Russell, who found that the cause of the collapse was a very intense œdema of the mucosal and submucosal layers of the left main bronchus, completely obstructing the lumen. During the operation the patient stopped breathing and her condition became critical, but she recovered after the administration of Coramine and carbon dioxide and oxygen.

May 11th.—She was now very ill and slightly cyanosed despite continuous intranasal oxygen which had been begun the previous day. A quantity of the new sulphonamide derivative, 2-(*p*-aminobenzenesulphonamido) pyridine or M. & B. 693, had been kindly provided by Dr. L. E. H. Whitby[12] and the first dose of 1 gramme was given orally the same evening.

May 12th.—The patient was delirious and definitely cyanosed; the right upper lobe was now involved. Temperature 103°–104° F., pulse-rate 120–130, respirations 40–50. The dose of M. & B. 693 was increased to 1 gramme four-hourly.

May 13th.—Consolidation of the right upper lobe was now very extensive, but the left was beginning to clear and the displacement of the mediastinum was notably less (Fig. 2). Owing to the increase in the cyanosis the blood was examined spectroscopically, but neither methæmoglobin nor sulphæmoglobin was detected; the temperature had fallen to 102° F.

May 14th.—She was now critically ill, her condition having begun to deteriorate the previous evening; both upper lobes were clearing, but the left lower lobe was now involved and she was becoming increasingly toxæmic; there was much diarrhœa. Leucocytes 37,200 (polymorphs 97 per cent.). The dose of M. & B. 693 was reduced to 1 g. three times a day. During the following 36 hours she received six injections of strychnine, gr. 1/30.

May 16th.—Resolution by lysis was now evident with a corresponding improvement in the patient's condition; both upper lobes had cleared considerably, though the left lower lobe was now consolidated (Fig. 3). Leucocytes 18,800 (polymorphs 89 per cent.). The dose of M. & B. 693 was reduced to 0·5 g. t.d.s. and stopped 48 hours later. She continued to improve steadily, the oxygen was stopped on *May 18th*, and four days later the temperature, pulse and respiration had returned to normal though there were still a few signs in the left lower lobe. The leucocytes had fallen from 16,000 on the *18th* to 8500 on the *23rd*; by the *26th* no abnormal physical signs could be detected. From the *22nd* to the *26th* five-minute inhalations of oxygen with 5 per cent. carbon dioxide were given two-hourly.

During the exhibition of M. & B. 693 the blood was repeatedly examined spectroscopically by Mr. G.

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FIGS. 1 2 3

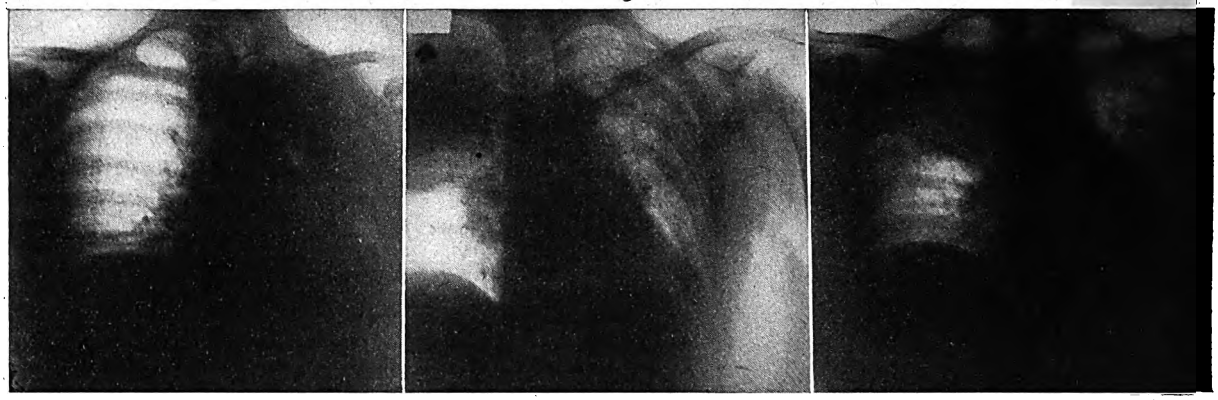

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FIG. 1.—Collapse of left lung. Displacement of mediastinum.
FIG. 2.—Consolidation of right upper lobe. Left upper lobe clearing. Re-expansion of left lung.
FIG. 3.—Left lower lobe involved. Re-expansion complete. Upper lobes clearing.

Discombe with negative results, nor were any other toxic effects noted.

BACTERIOLOGY

Gram films and primary cultures were made from the sputum and 0·2-0·3 c.cm. injected intraperitoneally into a mouse; after 18 hours the exudate was examined (1) by mixing with type-specific serum, agglutination and capsular swelling being observed, (2) for capsular staining by Muir's method. The results are set out in the accompanying Table.

BACTERIOLOGICAL FINDINGS

Date in May.	Gram film.	Sputum.	Mouse exudate.			
		Primary culture.	Agglutination.	Capsular swelling.	Capsular staining.	Blood culture.
9th	Pn: +++	Pure watery growth.	Type III.	++	++	—
11th	Pn: +++	Ditto.	„	++	++	Sterile.
12th	Pn: +	Pure atypical growth.	—	—	—	„
13th	Pn: +	Watery growth and atypical growth.	Slight Type III.	±	±	—

Until May 12th the sputum contained many pneumococci yielding a typical pure primary growth and mouse exudate (see Table). On the 12th after 3 g. of M. & B. 693 had been given, the pneumococci were scanty, pleomorphic and non-capsulated in the Gram film; primary culture yielded a pure atypical growth not agglutinated by Type III or any other serum and mouse inoculation produced an exudate showing no agglutination and no capsular swelling or staining; subculture of this exudate yielded a similar pure atypical growth.

On May 13th the Gram film showed few pneumococci; primary culture yielded both watery and atypical colonies and mouse inoculation produced an exudate showing only slight agglutination and little capsular swelling or staining. The exudates from the mice inoculated on the 12th and 13th were injected into further mice. Culture of the former produced a typical pure Type III watery growth after two passages and a typical Type III exudate; in the case of the latter capsular swelling and staining were still incomplete after two passages, though a typical watery growth had been produced. It is thus clear that the organisms isolated from the sputum on the 12th and 13th were Type III pneumococci which had undergone decapsulation.

Blood cultures on the 11th and 12th were sterile after 48 hours' incubation.

DISCUSSION

Complete collapse of a single lobe complicating lobar pneumonia is commoner than is usually supposed; records of minor degrees are numerous.[7 8 11] Massive collapse of a whole lung, however, is exceedingly rare; so far as we have been able to ascertain only about 10 cases have been recorded.[5] The left lung, either wholly or in part, is rarely affected: Finland and Loverud [5] reported 62 cases of complete lobar collapse, 60 of which occurred in the right lung; in 5 of these massive collapse involved the whole right lung. Collapse occurred usually in the affected lobe, less often in other lobes on the affected side; it was seen more often in the acute stages than during convalescence. Previous lung disease appeared to be a possible predisposing factor.[5]

In these cases the cause of the collapse is generally considered to be a plug of tenacious mucus or exudate obstructing the bronchus.[1 2 5 10 11] Some advocate inhalations of carbon dioxide,[3 9] others removal of the plug by bronchoscopy.[10 11] Coryllos and Birnbaum [2 3] favour both methods. The present case suggests that intense local œdema alone is a sufficient cause of obstruction; in this connexion Finland and Sutliff [6] have reported from post-mortem examination particularly severe changes in the bronchial mucosa of Type III pneumonia.

The mortality of Type III pneumonia is always high and increases with the age of the patient and the number of lobes involved. Finland and Sutliff,[6] analysing 282 consecutive cases, found the mortality to be 80 per cent. where only one lobe was involved in patients over sixty years of age. As in the case reported, in 60 per cent. of these the blood culture was sterile. No case with a positive blood culture had been known to recover. The prognosis was worse in females and when an upper lobe was involved.

That recovery should have occurred in this case is striking, in view of the patient's age, the number of lobes involved and the massive collapse of the left lung. To what extent this is to be attributed to the new sulphonamide derivative is difficult to say; encouraging clinical results have been reported by Evans and Gaisford [4]; in this case it is noteworthy

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that recovery began after exhibition of this drug at a time when the outlook appeared hopeless.

Whitby's experimental work [12] has shown that almost complete protection is afforded against Types I, VII, and VIII infections and a high degree against II, III, and V; he observed also that in the mice so protected, the capsules of the pneumococci became first swollen and crenated and eventually disappeared. The bacteriological findings in the case reported would support the experimental findings as to the mode of action of the drug.

Observations have since been made in two further cases with similar results. A man, aged 60, with extensive broncho-pneumonia due to a Type XI pneumococcus and *Hæmophilus influenzæ*, was given the drug on the fourth day of the disease and responded rapidly, the temperature falling to normal within 12 hours and remaining so. In three specimens of sputum obtained respectively 12, 24, and 36 hours after treatment began, the numbers of pneumococci progressively diminished and the exudate produced in mice contained cocci showing little or no agglutination and no capsular swelling with Type XI serum, while staining showed capsules to be absent altogether or present in only occasional cocci. By mouse passage these lost properties were restored, as in the previous case. A further specimen of sputum, obtained 3½ days after treatment began, contained fairly numerous pneumococci with good capsules and produced an exudate in a mouse containing fully capsulated and agglutinable Type XI cocci. It appears therefore that as in the first case capsulated pneumococci may reappear in the sputum after several days of treatment.

The course of events was somewhat different in the third case, a male diabetic aged 34, with Type I lobar pneumonia. M. & B. 693 was given on the second day of the disease and the temperature fell by rapid lysis in the ensuing 48 hours, thereafter remaining normal. The apparent effect of the drug in this case was to cause the rapid disappearance of pneumococci from the sputum. A specimen obtained 18 hours after treatment began contained a few pneumococci and caused delayed death in a mouse, with a characteristic Type I exudate showing capsules and capsular staining; specimens after 24 and 60 hours, although still rusty in appearance, contained no pneumococci demonstrable in film or culture and failed to kill mice.

SUMMARY

A case of massive Type III pneumonia complicated by collapse of the entire left lung is described. The patient, a woman aged 65, was treated by 2-(*p*-aminobenzenesulphonamido) pyridine and made a good recovery. Full bacteriological findings are published for the first time in three cases treated with this drug. In one the apparent effect was to cause the rapid disappearance of pneumococci from the sputum, in the others the loss of capsules and consequently the type-specificity of the pneumococci; these were restored by repeated mouse passage.

The incidence, ætiology and pathology of massive pulmonary collapse occurring in lobar pneumonia are discussed; it is suggested that this rare complication may be caused by intense œdema of the bronchial mucosa.

We are indebted to Dr. G. Graham, Dr. A. E. Gow, and Dr. A. W. Spence for permission to publish these cases; to Dr. Graham and Prof. L. P. Garrod for their advice and criticism; and to Dr. Whitby and Messrs. May and Baker Ltd. for supplying the 2-(*p*-aminobenzenesulphonamido) pyridine.

One of us (W. A. O.) is in receipt of an expenses grant from the Medical Research Council.

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MEDICAL SOCIETIES

RESEARCH DEFENCE SOCIETY

Prof. C. H. BEST, F.R.S., delivered the twelfth Stephen Paget memorial lecture at the London School of Hygiene and Tropical Medicine on June 9th, with Lord LAMINGTON, the president, in the chair. His subject was

Insulin and Diabetes: the Present Position

Prof. Best, after expressing his complete agreement with the aims of the Research Defence Society, suggested that the story of insulin might serve as an example of the advances which might result from the appropriate use of animal investigation. The preliminary work leading up to the preparation of insulin had been done on dogs, as the pancreatic gland could be removed completely in these animals; the procedure used was the same as that adopted for removal of the human pancreas when that became necessary. Only in the last few years had means been found to remove sufficient pancreas from rats or rabbits to produce diabetes in them. The discovery of insulin was due to the pioneer work of Banting, Macleod, and the biochemists who had evolved the technique for the estimation of small amounts of sugar in blood. The stages which led up to the discovery were now well known. Early in 1922 Banting and Best had decided to attempt the preparation of insulin for clinical trial and after some preliminary attempts resorted to alcoholic extraction which proved an immediate success. Material extracted from a pancreas after aseptic removal had been tried on the experimenters themselves and then on a severe diabetic. Soon through collaboration with Dr. J. B. Collip a group of patients came under treatment, but in dealing with large quantities the art of obtaining insulin (it could not then be called a science) was lost and some of the patients lapsed into coma and died. Banting and Best then worked harder and longer instead of adopting the wiser course of taking a few days off and going for a gallop on horseback. But eventually a method was evolved by which large quantities of insulin were made available, and they were put on the market for the first time by the Connaught laboratories of the University of Toronto.

Prof. Best then showed a colour film, made in Canada, of the modern manufacture of insulin. The masses of beef and ox pancreas were minced and extracted with alcohol; the solution was separated by a basket centrifuge, filtered, and concentrated in

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vacuum stills, and the insulin precipitated by common salt. The insulin which then came to the top was purified by physical and chemical means, tested on mice and rabbits, filled into sterile vials, and made ready for delivery. Prof. Best explained that the cost of the containers and of the distribution was high in proportion to that of the insulin and so the increased yield of insulin now obtainable had not permitted a great reduction in price. The one or two pounds of insulin obtained in one batch from 2400 lb. of glands would be sufficient to last a diabetic 2000 years taking 35 units a day. A dog shown in the film was of particular interest as, in confirmation of the work of F. G. Young at the National Institute of Medical Research, Hampstead,[1] it had been rendered diabetic by injections of pituitary extract; subsequent complete removal of the pancreas had not intensified the diabetes and the islets in the pancreas had been found to be atrophied; the dog still lived quite happily on a daily injection of insulin.

Vigorous efforts had been made in many laboratories to purify insulin to a crystalline product. The goal had finally been reached by Prof. J. J. Abel of Johns Hopkins University. Many forms had since been prepared, but the potency of the insulin remained the same irrespective of the shape of crystal. A further step was made when Dr. D. A. Scott had shown that zinc was necessary for the formation of crystals. At the present time crystalline insulin, 22 units per mg., was the unit for standardisation, the "yardstick" of crystals being deposited at the National Institute at Hampstead and at Toronto.

Soon after the introduction of insulin complaints began to be made about the necessity for such frequent injections. Prof. H. C. Hagedorn and his colleagues at Copenhagen had now succeeded in preparing protamine insulin, which was much more slowly absorbed into the animal system. The effect of delayed action could also be obtained by the addition of zinc, and a mixture of protamine insulin with zinc had advantages over either preparation alone; the suspension of protamine insulin was more stable with zinc. Protamine zinc insulin was now being largely used in Canada and in the United States —in fact formed about 30 per cent. of the total insulin distributed. Free insulin had also been added to the mixture in order to obtain an initial quick absorption, but Prof. Best was not sure whether this was worth while. More recently a group of workers in U.S.A. had prepared a clear protamine zinc insulin which would be easier to sterilise by filtration than that at present in use and would gain by being homogeneous. Its effect was perhaps not so prolonged, judging by the data so far available, but it was effective enough to be useful.

The diabetic mortality in Ontario, where insulin had been available ever since its discovery, had fallen steadily since its introduction, and graphs of the mortality-rate among those below and above 50 years of age suggested that it had fallen steadily among those in the younger group and had risen in those of the older group, indicating the longer survival of diabetics. The graph of the distribution of insulin in Canada was a smooth curve becoming steeper and steeper. Although the older practitioners were not using very much insulin, the younger ones, trained to its applications, were using more and more. Prof. Best's advice to medical students was not to read all the 10,000 articles on insulin which had accumulated, but to apply the advances of medical knowledge to disease. He assured diabetics that progress was continuing to be made and that they could look forward to more benefits in the future.

Sir EDWARD MELLANBY, F.R.S., moving a vote of thanks, said that the occasion had been an intellectual treat: an excellent delivery on a subject which had affected the lives of thousands by one who had contributed largely to it. It was indeed a topsy-turvy world where medical men had to justify their actions. He himself had treated diabetics before and after the introduction of insulin; he had thus personal experience of the change from the time when the doctor could only prolong his patient's life for a matter of weeks to modern times when it was possible to approach the patient jauntily, knowing that he could be made fit for any job in a few weeks. The discovery of insulin was only one of many advances made in recent years. Knowledge had been gained not only of the control of disease but of its prevention. It was however often forgotten that what was out of sight was out of mind. The absence of disease was unnoticed. The discovery of insulin was of dramatic interest and all would wish to congratulate Prof. Best on the part he played in it.

Dr. R. D. LAWRENCE seconded the vote of thanks, as a representative of those average healthy diabetics saved by Banting and Best.

[1] *Lancet*, 1937, 2, 372.

NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY

A MEETING of this society was held in Leeds on April 29th, when Dr. J. W. A. HUNTER (Manchester) read a paper on the

Effect of Amputation of the Cervix on Subsequent Pregnancy and Labour

In view of the increasing adoption of extensive plastic procedures in women of childbearing age in preference to pessary treatment, Dr. Hunter pleaded for a more conservative attitude to endocervicitis and cervical lacerations. A study of reports of the dangerous sequelæ of cervical amputation and repair showed that these operations in women of childbearing age might cause sterility, repeated abortion or premature labour, or obstructed labour. His interest was first drawn to the subject by seeing a case under the care of the late Dr. Haig Ferguson. The patient had had her cervix amputated previously and had seven subsequent abortions. A first and living child was at last obtained after the patient consented to remain in bed from the onset of the pregnancy. In the last nine months Dr. Hunter had encountered 9 further cases of abortions occurring for the first time after cervical amputation. On the question of dystocia Dr. Hunter described a series of 18 cases of labour following cervical operations. In 10 cases the labour was uneventful; in 3 Cæsarean section had to be done, in 3 vaginal Cæsarean section, and in 2 manual dilatation of the cervix. There were 3 maternal deaths following delivery by the vaginal route, all being due to a rupture of the cervical stump extending up into the lower uterine segment.

In an attempt to minimise the dangers of cervical plastic surgery Dr. Hunter had devised a modification of the usual plastic technique to be used in some cases of prolapse occurring in young women, particularly those in which little cervical hypertrophy was present and the length of the uterus did not exceed 3½ in.; these were cases with relaxation of all the

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uterine supports. Essentially the operation consisted of one circular incision about ½ in. above the external os and another 1 in. to 1½ in. above this, enabling a complete circle of vaginal skin to be removed. The customary anterior colporrhaphy was then performed, completed by first suturing the cervix to the vaginal skin, beginning behind and working round to the front of each side. Thus the Fothergill principle of sliding the uterus upwards and backwards was maintained but with conservation of the cervix. Sometimes after the operation the uterus tended to remain in the vaginal axis. This could be remedied by opening the anterior peritoneal pouch and stitching the uterus to the peritoneum at the level of the anterior colporrhaphy, or alternatively by performing a Gilliam's suspension operation.

DISCUSSION

Prof. DANIEL DOUGAL (Manchester) complimented Dr. Hunter on a timely paper. He had himself once done a similar operation. He advocated only a low amputation in these cases of prolapse in young women.

Mr. BRYAN JEAFFRESON (Leeds) confirmed from his own cases the increased tendency to abortion after cervical amputation. The main technical operative difficulty in dealing with this type of prolapse was that unless something was done to fix the cervix the vaginal walls tend to sag after the operation.

Mr. GLYN DAVIES (Sheffield) stressed the need for removing the unhealthy tissues surrounding the os uteri; he found that taking off even a shaving from the cervix sufficed to enable the Fothergill operation to be performed. In an analysis of 400 cases he had found that only 60 per cent. of the women who could have conceived after the operation actually did so.

Mr. BRYAN WILLIAMS (Liverpool) did not think that cervical repair had a significantly sterilising effect and held routine amputation of the cervix to be quite unjustifiable in women of childbearing age.

Prof. W. FLETCHER SHAW (Manchester) welcomed criticism of the Fothergill operation in view of its widespread adoption. He did not think the operation had a sterilising effect, but rather the reverse. In about one-third of the cases the prolapse recurred after a subsequent labour.

Clinical Cases and Pathological Specimens

Mr. C. H. WALSH (Liverpool) described a dermoid cyst complicating pregnancy in which the diagnosis was attained by the radiological demonstration of the contained teeth. The case illustrated the need for a routine vaginal examination during pregnancy.

Prof. FLETCHER SHAW described cases of primary amenorrhœa followed by ovarian carcinoma in two sisters. The first sister was 21 years old and had never menstruated. She had a tumour removed that was then labelled an endothelioma but would now probably be classified as a disgerminoma. She was well 17 years after this operation, although menstruation had not occurred. The second sister who had never menstruated either, had a large abdominal tumour, a glandular carcinoma. The tumour was removed at the age of 27; the growth recurred soon after removal.

Mr. A. GOUGH (Leeds) described a case of disgerminoma of the ovary associated with masculinisation, on account of which a confident pre-operative diagnosis of an arrhenoblastoma was made. The microscopical appearances however did not tally at all with those observed in the arrhenoblastomas.

Prof. A. M. CLAYE and Dr. N. LISSIMORE (Leeds) described a granulosa-celled tumour associated with post-menopausal bleeding. Its histology was that of a columnar-celled tumour with alveolar formation in some areas.

Mr. JEAFFRESON described a case of an atypical ovarian fibroma with definite post-menopausal bleeding. The unusual feature of the case was that careful microscopical examination of the tumour revealed no granulosa cells at all, all the cells being of the connective tissue type.

INCIDENCE AND CAUSES OF BLINDNESS IN DIFFERENT COUNTRIES

THE International Association for Prevention of Blindness was founded in September, 1929, at the Hague with three objects: (1) To study the causes, direct and indirect, which may result in blindness or impaired vision. (2) To encourage and promote measures to eliminate such causes. (3) To disseminate knowledge on care and use of the eyes. It has representatives in 40 countries and its affairs are managed by an international executive committee of 13 members, the representative of Great Britain being Mr. A. F. MacCallan. It was soon apparent that reliable data on the incidence of blindness in various countries and on its causes were lacking, and that in their absence the association could not implement their aims in the matter of prophylaxis. The early inquiries made by the Association were carried out on the instructions of Prof. F. de Lapersonne of Paris, the honorary president, whose death after the preparation of the report[1] is deplored in a footnote.

Since blindness is due to a multiplicity of causes, and since the relative importance of these vary according to country, the first step was to stimulate the formation of national committees to collect and supply information. Two were already in existence in 1929—the Standing Committee on the Prevention of Blindness of the Union of Counties Association for the Blind (London), and the National Society for the Prevention of Blindness (New York); there are now thirteen.

DEFINITION AND CLASSIFICATION

One of the early difficulties was the fact that there is no universally accepted definition of blindness and no international classification, and from 1933 consideration was given to the possibility of establishing a classification of causes that would meet with general acceptance. It was recognised, however, that the value of definitions and classifications depend on their sound application, and that in very few countries is the registration of the blind exclusively entrusted to ophthalmologists. The only comparable national statistics are based on census records, and though these have the advantage of covering the whole of the territory of the country and of including all classes of the community there must be considerable divergencies in practice in the selection of those registered as blind. The circumspection needed in the assessment of statistics of blindness and still more of statistics of the causes of blindness is emphasised.

With these reservations in mind, two conclusions

[1] The Number of the Blind and the Protection of the Eyes in different Countries, according to replies to a questionnaire from the International Association for Prevention of Blindness. XV Concilium Ophthalmologicum, Paris. 1937. Pp. 283.

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were reached from the returns made by 35 of the 63 countries to which a questionnaire was sent :—

1. That for future investigations the most accurate definition of blindness would be the total absence of the sense of sight.

2. (*a*) Some of the commonest causes of blindness such as syphilis, ophthalmia neonatorum, small-pox, become progressively more rare or less severe.

(*b*) Others, like trachoma, tend to subside in countries where there is a well-organised campaign.

(*c*) Some lesions which used to be incurable, like detachment of the retina, are less and less frequently followed by blindness.

The enormous variation in the incidence of blindness in different countries is shown in tables—e.g., from 32 per 100,000 in New Zealand to 776 per 100,000 in Egypt. The Association make no attempt to draw any comparison in the age-incidence owing to the great differences observed in the various countries.

PROPHYLAXIS

The subject of prophylaxis is discussed under diseases and groups of diseases, with figures for individual countries, and the variations of the picture are clearly brought out. Ophthalmia neonatorum is disappearing as a cause of blindness in many countries ; for this credit is given to Credé's method. Surprise is expressed that, in Great Britain, the Prevention of Blindness Committee is not prepared to insist on the routine use of prophylactic drugs, though it is noted that between 1914 and 1933 the rate of blindness in infants came down from 8·3 to 4·6 per 1000 births. Special reference is made to the work of Mr. MacCallan on trachoma in Egypt, and to Mr. Bishop Harman's masterly account of the eradication of this disease in London ; the principal general measures advised are improvement in the conditions of life, isolation of infected individuals, the treatment of subjects and healthy contacts—the latter by instillation of a solution of zinc sulphate—and the systematic sterilisation of towels.

The other potential sources of blindness discussed are glaucoma, injuries, hereditary and congenital lesions, errors of refraction, small-pox and infectious diseases, xerophthalmia, and quackery. Errors of refraction form, perhaps, the most important group so far as this country is concerned. Particular attention is directed to the ophthalmic benefit of the National Health Insurance scheme and to the fact that, whereas 34·6 per cent. of cases examined by ophthalmic surgeons show some other conditions than mere errors of refraction, the records of approved societies show that only 1·0 to 4·6 per cent. of cases are referred by sight-testing opticians to ophthalmic surgeons. An interesting account is given of the "ophthalmic consultations" in rural districts of Missouri which enable persons in very sparsely populated areas to be examined by ophthalmic surgeons.

Measures for the reduction of industrial hazards are discussed with emphasis on the difficulty of persuading workers in the metal trades to accept the optional or compulsory use of goggles to protect them from fine chips. Legal requirements in different countries and bases for compensation are also given. With a view to the prevention of definitely inheritable disease the Association advises that workers attached to all institutions for the young blind should when necessary explain to the parents the danger of having other children, or the advisability of seeking treatment of any causative disease.

The detailed replies from the different countries to the questionnaire fill more than half the report, and it is the analysis of these valuable data which will, it is hoped, provide a foundation for the guidance of those responsible for the prevention of ophthalmic trouble throughout the world.

REVIEWS AND NOTICES OF BOOKS

Traumatismes du pied et rayons X

Malleoles, astragale, calcanéum, avant-pied. By ÉTIENNE DESTOT, de Lyon. Second edition produced by E. GALLOIS and P. JAPOIT. Paris : Masson et Cie. 1937. Pp. 292. Frs.45.

Étienne Destot died in 1918, after serving his country throughout the war. His friends, convinced that his work should not be forgotten, have produced a second edition of his remarkable book. The surprising thing is that in what is essentially the original text the discussion of the mechanics of the foot, and of the part played by the various joints in which the astragalus is involved, reads like the most modern orthopædic teaching. We are accustomed now to scepticism about the nature of the transverse tarsal arch and the importance of retaining its shape ; but Destot had already shown more than a generation ago that in walking this arch flattens out, and he had laid the blame for one type of metatarsalgia at the door of the shoemaker and his narrow shoes. Only a few weeks ago Dr. G. Inster pointed out to the Anatomical Society the fallacy of regarding the foot as functionally divided at the mid-tarsal joint. Destot's conception of the way in which the astragaloid joints work anticipated his comments. The force stimulating this and other ideas seems to have been the study of radiology, then in its youth. Destot demanded *expert* interpretation of radiograms, leaving one in no doubt as to what he meant by an expert ! Specifically he excluded "professors of photography," and young doctors who decide to specialise without clinical experience. His own claim to speak from experience is undisputed, and when he said that, since the publication of Bondet's thesis in 1899, he had seen one hundred cases of fracture of the posterior margin of the lower articular surface of the tibia, and only seventeen cases of fracture of the anterior surface, we have a good indication of the relative frequency of these lesions. He considered himself at liberty to question the commonly accepted mechanism of production of the various fractures, remarking wisely that after an accident it is very difficult for the patient to be quite sure what did happen. Alexis Carrel says, in a preface, that Destot had the gift of going straight for facts, understanding them, and turning them round in his mind till he had penetrated their significance. He started with a notion of the ankle and foot that in itself must have been enlightening at a time when fractures were hardly included in the province of orthopædic surgery. He talked of "le pilon tibial et la mortaise." He showed how the fibula is broken by overstrain of the "mortaise," while the posterior marginal fracture occurs when the weight of the body is exerted so as to push the foot backwards on the "pilon." He realised fully the importance of this particular fracture, and that its gravity could not be judged by the size of the fragment torn off, which was an index rather of the degree of involvement of the internal malleolus ; the degree of subluxation of the foot alone mattered. So modern is the outlook of the

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author that, when he mentions post-traumatic œdema and osteotrophy, one half expects him to advise the ambulatory plaster and the walking iron. Drs. Gallois and Japoit have added numerous fresh radiograms which are a help in following the subject matter, but they chiefly deserve our thanks for having preserved for us a valuable text.

The Medical Annual

A Yearbook of Treatment and Practitioners' Index. Edited by H. LETHEBY TIDY, M.D. Oxon., F.R.C.P., and A. RENDLE SHORT, M.B., B.S., F.R.C.S. London: Simpkin Marshall; Bristol: John Wright and Sons. 1938. Pp. 696. 20*s*.

FOR the fifty-sixth year the "Medical Annual" presents in a compact and readable fashion the advances in treatment made in the previous twelve months. Of these chemotherapeusis claims first place. The first reports of outstanding success with new drugs are seldom confirmed and extended with such unanimity as has blessed the sulphanilamide group. The speed with which new uses are found for these drugs makes any survey out of date almost before it is published; the account here given of those which were established in 1937 provides a most useful landmark. The plea for the record of failures as well as successes in clinical practice is made in the interests of statistical assessment of the value of this group of drugs in infections by various organisms. The enthusiasm with which sympathectomy has been performed on cases of peripheral vascular disease has been tempered during the last few years; but disappointment following operation for Raynaud's disease of the upper extremity has been lessened by the introduction of the operation of preganglionic sympathectomy. The good results said to follow sympathectomy in thrombo-angiitis obliterans are now attributed to the dilatation of collateral vessels rather than to any effect on vessels already diseased. In the course of a discussion on the value of sympathectomy for hyperpiesia it is here noted that splanchnisectomy appears to cause a definite fall in blood pressure in about a third of the cases subjected to it. Over the short period of time during which they were observed two-thirds of the patients in a small series of cases said that they felt the better for the operation. In the face of the accumulating evidence that the sympathetic nervous system plays no part in the causation of hypertension, however, the surgical treatment of this condition must be regarded as still experimental.

The improvements in the technique of thoracic surgery are reflected in the account of a series of lobectomies showing a mortality-rate of only 2·6 per cent. Since in this series no patient was denied operation for whom lobectomy offered a reasonable chance of improvement, and the patients rejected were mostly those who were hardly ill enough to warrant such a serious operation, this low rate is a remarkable achievement. The advancement of the surgical treatment of phthisis by the creation of extrapleural apical pneumothorax, and methods recently introduced for the surgical treatment of cardiac ischæmia are duly noted. Particularly useful articles are those on the scope of the new insulins and on changes made in the treatment of diabetes in adults and in children. The final word on the histidine treatment of gastric ulcer is that the investigations of the last two or three years compel one to regard any action it may have as psychological. A warning of the dangerous sepsis that may follow electro-resection of the prostate is the more emphatic because it comes from those who were formerly inclined to favour this technique.

Whilst such unusual phenomena as gargoylism, congenital webbing of the limbs, and human bites are not ignored, common minor maladies receive their full share of attention; we note a résumé of the methods of treating in-growing toenail, and notes on the treatment of the bunion. The discussion of the management of disturbances at the menopause is particularly helpful. Following an account of the newer sclerosing solutions for the treatment of varicose veins comes the estimate that in more than half the cases surgery in the form of saphenous vein ligation is essential for complete cure.

The alphabetical arrangement of the articles under disease headings in this annual, its excellent illustrations, and the easy style of the writing make for comfortable armchair reading. Those who have the habit of buying and studying it year by year will find that very little of practical importance in medicine is allowed to escape their attention.

Modern Treatment in General Practice 1938

Volume IV. Edited by CECIL P. G. WAKELEY, D.Sc., F.R.C.S., F.R.S.E., F.A.C.S., Fellow of King's College, London; Senior Surgeon, King's College Hospital; Editor of the *Medical Press and Circular*. London: *Medical Press and Circular*. 1938. Pp. 440. 10*s*. 6*d*.

THIS series aims at providing a link between specialised and general medical knowledge by the presentation of only those modern therapeutic methods which have been thoroughly sifted and tested by hospital experience. The present volume is divided into five sections. The first and largest contains 32 articles on subjects as various as the treatment of mental disorders by electro-pyrexia, lobectomy for bronchiectasis, the treatment of alcoholism, the indications for Cæsarean section, and the use of plaster in the treatment of fractures. There follow five articles on pitfalls in the diagnosis of abdominal disease. The third section is concerned with the diseases of infancy and childhood. In one of them Dr. W. R. F. Collis expands the older conception of leg pains in children as being generally due to acute rheumatism. The fourth section contains authoritative articles on the treatment of difficult fractures and the last section is devoted to dermatology. Such collections of short articles in diagnosis and treatment, though of less value than post-graduate courses to the general practitioner, undoubtedly help him to keep on terms with diagnostic and therapeutic progress.

Body Mechanics

Second edition. By JOEL E. GOLDTHWAIT, M.D., LL.D., Member of Board of Consultants, Massachusetts General Hospital; LLOYD T. BROWN, M.D., and LORING T. SWAIM, M.D., Instructors in Orthopedic Surgery, Harvard Medical School; and JOHN G. KUHNS, M.D., Assistant Instructor in Orthopedic Surgery at the school. London: J. B. Lippincott Company. 1937. Pp. 263. 18*s*.

Dr. Goldthwait's analysis of body mechanics and the methods of rectification he has devised are well known both in America and here. This book, written in conjunction with three of his colleagues, orthopædic demonstrators at Harvard, deals with the application of his theories and methods to the treatment of chronic disease. Their thesis is that since physiological functions depend on the structure and stance of the body pathological results may ensue

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if these are not properly maintained. The logical sequence of structural disability, to which the attention of medical students is perhaps too rarely drawn, is fully analysed in the early part of the book. Certainly the fundamental readjustment of body stance, as here advocated, seems to have had a favourable effect on the health of many patients who suffer from chronic diseases. Records are supplied of cases of arthritis, diabetes, multiple sclerosis, and chronic gastro-intestinal disorders, all chronicling good response to a basic régime of which the principal features are detailed. These include a period of rest in the recumbent position, with pillows to support the spinal curves and raise the ribs, and with progressive plaster casts to straighten any contracted joints. During this period, exercises are carried out to relieve tension and to encourage muscle tone. On getting up, the patient is fitted with a supporting and often corrective brace, and is taught exercises designed to increase strength and promote good posture habits in sitting and in standing. We can well imagine that such measures bring benefit to many despondent sufferers when they are used to supplement rather than to replace orthodox medical treatment.

Textbook of Ophthalmology

By SANFORD R. GIFFORD, M.A., M.D., F.A.C.S., Professor of Ophthalmology, Northwestern University Medical School, Chicago; Attending Ophthalmologist, Passavant Memorial, Cook County, Wesley Memorial and Evanston Hospitals. London: W. B. Saunders Company. 1938. Pp. 492. 18*s*.

THIS text-book gives an admirable survey of the essentials of ophthalmology for the student and practitioner. Its descriptive matter is concise and easy to read and except for the reproductions of fundus photographs the illustrations are good, the 10 coloured plates of external and fundus disease particularly so. Where the subjects of any chapter warrant a fuller discussion than is possible within the limits of this book Prof. Gifford has given a short list of the more important references. He is a little dogmatic at times about treatment, especially in emphasising the advantages of the surgical technique he himself prefers, but this is better than too many reservations in a student's text-book. Recent work in the surgical treatment of retinal detachment, orthoptic training, and other matters of current interest have received appropriate attention.

The appendix contains an interesting and valuable account of the appraisal of loss of visual efficiency assessed by the standard method approved by the House of Delegates of the American Medical Association on May 26th, 1925. The coördinate factors regarded as necessary for full visual efficiency are the central visual acuity, the visual field, and the muscle function. It is upon the impairment of these factors that the damage is mathematically assessed by a formula.

The Physician's Business

Practical and Economic Aspects of Medicine. By GEORGE D. WOLF, M.D., Attending Otolaryngologist, Sydenham Hospital, New York City. London: J. B. Lippincott Company. 1938. Pp. 384. 21*s*.

THIS book advises the young doctor upon such varied topics as the choice of a medical career other than private practice, specialisation, professional contacts, fees, the planning and equipment of a surgery, income-tax record-keeping, how to broadcast, and how to avoid lawsuits. Owing to the numerous differences in procedure in the two countries, much of the subject matter will be less serviceable here than in the United States. Without denying the general soundness of Dr. Wolf's counsel we find that it tends, in some places, to be over-detailed. Thus, for example, he devotes many pages to lists of instruments required for certain operations or for a complete surgery equipment. These surely are matters which the doctor must decide for himself. He who diligently follows all the precepts laid down for his guidance in this book will undoubtedly become a shrewd and tidy-minded man of business; whether he will remain, in the best sense, an attractive doctor is another matter. The inclusion of a price-list of operations hardly follows the best medical tradition.

Sir Grafton Elliot Smith

A Biographical Record by his Colleagues. Edited by WARREN R. DAWSON, F.R.S.E., V.P.R.S.L., F.S.A. London: Jonathan Cape. 1938. Pp. 272. 12*s*. 6*d*.

Grafton Elliot Smith was one of those few in our profession whose name and fame passed into public currency. Primarily devoting much of his time to one of the least expansive of the medical sciences if regarded in a narrow sense, he found ways of extending his work in unusual directions. For Elliot Smith was more than an anatomist, he was a humanist—in the tradition of nineteenth-century scientific humanism, represented by such men as the Herschells, Huxley, and Tyndall. To such men science was no hole-and-corner affair but the concern of every intelligent man, and the urge to keep their subject interesting to all and sundry no doubt led their research and speculation into wide and fundamental channels.

Elliot Smith was born in Australia and received his basic training there. At the age of 25 he came to England and settled down at Cambridge as a research student under Alexander Macalister. The latter was not, perhaps, an entirely congenial chief for such a restless and speculative spirit, but he was a remarkable man in his dry and precise way, and contact with his encyclopædic, if formal, mind must have encouraged a broad outlook in his pupils. It was no doubt to Macalister's good offices that Elliot Smith owed the fellowship at St. John's which first gave him a stabilised position as a research worker, and certainly it was on his chief's recommendation that he was appointed to the chair of anatomy at Cairo. Here contact with the problems of Egyptian archæology set him on the path of anthropological investigation which he subsequently pursued with such success. How far Elliot Smith's speculations on the history of human civilisation, and in particular his views on the diffusion of culture, will be substantiated by future research cannot as yet be guessed. His hypotheses are still the subject of warm controversy. At least they have stimulated contemporary anthropological thought, and the methods he introduced have become part of the stock-in-trade of anthropological technique. This record of Elliot Smith's life, compiled by colleagues and pupils, gives a vivid picture of his personality and activities, and includes a short autobiography, unfortunately incomplete. The general sketch by Mr. W. R. Dawson is supplemented by contributions from the late Lord Rutherford, J. T. Wilson, F. Wood Jones, J. S. B. Stopford, and H. A. Harris, and A. J. E. Cave gives a critical account of Elliot Smith's place as an anatomist and W. J. Perry discusses his contributions to cultural anthropology. This record of an energetic and productive life should find favour within and without the medical profession.

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THE LANCET

LONDON: SATURDAY, JUNE 18, 1938

THE TRIAL LABOUR—AND AFTER

In the hearty bracing atmosphere of nineteenth-century midwifery the loss of one out of the large family expected was not deemed of great moment. If one did not die at birth it probably would during early childhood and if the mother spent much of her later life dragging herself about with a bad backache this was seldom connected with her obstetric history even if this involved several difficult extractions. She was usually still able to do her housework or, in another social class, to appear in a tea-gown to welcome her menfolk when they returned from their recreation of sport or sport spectator. Realisation of the remote dangers of the long strong pull in forcibly separating one living creature from another, even if both survived and neither was seriously damaged at the time, came later and was enhanced by growing doubts as to our powers of predicting accurately when brute strength would be needed for delivery. The elaborate system of pelvic measurement on which reliance had once been placed left out of account many factors, including the size of the child, the dynamic and obstructive muscular forces, and the fact that the mechanism of labour of text-books is liable to be upset by very trifling maladjustments. Great things were hoped from the development of the movement for routine antenatal supervision and some disappointment was felt that the improvement in neonatal mortality and in maternal morbidity was not more rapid after the habit of seeking antenatal care had become fairly widespread. The next stage, perhaps a reaction to this disappointment, was a fairly general accord of opinion among obstetricians not to worry about exact degree of disproportion, since one of two expedients—Cæsarean section or induction before term—would ensure easy delivery of a live child at little increased risk to the mother. Unfortunately the clinical impression of the safety of the classical Cæsarean as a routine procedure in all sorts of obstetric abnormalities was not confirmed by statistics; and an aftermath of complications of subinvolution, hæmorrhage, and rupture at a subsequent pregnancy began to trouble its advocates. It took even longer for obstetricians to become convinced of the risks of induction, and even now this is practised by the older generation much more readily than by some of their juniors. All generations, however, have become doubtful of their powers of prophecy—having learnt that fears based on pelvimetry or even on radiography are often groundless and that on the other hand many primiparæ of the fine strapping type have difficult and even unsuccessful labours.

The fashion has swung round to a deliberate policy of non-interference during the first labour, on the sound basis that nature has resources stronger and safer than any yet devised by man. This expectant treatment, which is pursued by choice in hospital or nursing-home where operative intervention at a late stage is less dangerous than in the patient's home, has justified itself by the large proportion of successful results achieved. By its use we may in time be able to build up rules for obstetric practice on a much surer foundation. There are, however, many cases where trial labour has not produced a living child and the effect of frustration of the maternal urge has been lasting. The conduct of the second pregnancy then becomes a problem which according to a practitioner who sends us notes of a recent case must not be dealt with without regard to psychological as well as physical risks.

A woman of 25 with a normal conjugate but a narrow transverse diameter had her first child weighing 9 lb. stillborn after a long labour and a breech presentation in spite of apparently successful version. The loss of the child caused the patient great unhappiness and it required all her fortitude to face a second pregnancy three years later. She was insistent that a live child should be secured short of very serious risk to herself, and the obstetrician had decided to perform a Cæsarean section at term if there were the slightest sign of disproportion. The patient ruptured her membranes at the 35th week, following a normal pregnancy. Much liquor had drained away after nine hours and pains had not begun. The child was small, in a vertex position, and its heart sounds were good. The decision was taken to operate in spite of the absence of obstetric indications. The patient's mental and social outlook were such that a second disaster might well have endangered the success of her married life. The increased risk to the mother of operation at a later stage if labour failed to start soon, and the fear that the chances of survival of a premature child after a dry labour would be jeopardised even if it was born alive, were factors influencing the decision. A girl weighing 4¼ lb. was delivered by Cæsarean section.

The mother's convalescence was not uneventful, owing to an infected hæmatoma, and involution was slow; but her emotional state was one of complete satisfaction. She was soon planning the date of her next pregnancy, quite aware that delivery must be under careful observation with the probability of operation.

The practitioner who sends us these notes admits that the delivery by operation of a small child which would have passed easily through the pelvis is not orthodox obstetrics. The mother is now faced with the probability of further operations for the birth of any future children. That their number should be restricted does not concern her, since, as we are informed, the pregnancies that she may safely be allowed exceed the number that she desires. But she may fail to conceive again as promptly as she has done on the last two occasions and the subinvolution of the uterus may yet give her trouble. As against all this the delivery of a normal live child without any mental strain or anxiety as to its fate made her a satisfied woman, content to make a success of her family. Clearly in this case a Cæsarean section was not essential for mechanical reasons and many, perhaps most, obstetricians would have preferred to risk a dry labour. It was the recollection of a previous

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catastrophe that turned the scale. Perhaps in obstetrics more than in any other branch of clinical medicine the doctor is justified in letting his knowledge of the previous experiences and the temperament of his patient influence his decision in an emergency which threatens mental as well as physical health.

THE ÆTIOLOGY OF PEPTIC ULCER

"UNDER certain circumstances," says Prof. BABKIN,[1] "owing to some defect in the secretory mechanism, gastric secretion may deviate from its normal course, and conditions may arise which initiate destructive processes in the gastric mucosa." What are these circumstances, this defect, these conditions? The circumstances are variously interpreted, but the later stages of the sequence by which ulcers may be produced are now becoming a little clearer: the tendency increasingly is to suppose that the defect is neurogenic and that the condition first produced is an ischæmia. These ideas, originally put forward by VIRCHOW and ROKITANSKY, received clinical support in 1931 from CUSHING'S observation that patients with cerebral tumours may develop acute perforating erosions of the stomach. This coincidence of events has now been reported so often that it can hardly be accidental. Unfortunately the damage caused by such a tumour is so widespread that post-mortem examination does not give much help in the localisation of the brain area connected with the gastric lesions; but BEATTIE,[2] WATTS and FULTON,[3] and others have demonstrated that damage or stimulation of the hypothalamic region in cats and monkeys is followed by hæmorrhage, erosion, and even perforation in the stomach and duodenum. CHRISTOPHE[4] now reports cross-circulation experiments in dogs showing that after severe burns a substance is carried by the blood which severely injures the paraventricular nuclei of the hypothalamus. Such animals later developed diffuse acute gastric hæmorrhage and erosions.

The path by which lesions of the hypothalamus cause damage of the stomach is presumably through the vagus, and in this connexion the work of MANNING, HALL, and BANTING[5] is significant. By continuous electrical stimulation of the vagus in the dog they were able to induce gastro-intestinal disturbances, and actual congestion and hæmorrhage of the duodenum and pylorus was observed at autopsy. Atropine abolished the effects and eserine accentuated them so that ulcers formed. NECHELES,[6] in studying the effect of acetylcholine on the circulation of the stomach, has shown that small doses of this substance, comparable with those liberated by vagal stimulation, diminish blood flow, and thereby produce areas of devitalised tissue. BABKIN[1] suggests that vagal over-activity liberates histamine, or a histamine-like substance, in similarly harmful quantities. He believes that histamine, largely by dilating the capillaries and letting plasma leak out of them, may produce stasis in parts of the mucosa and thereby lay these open to attack by gastric juice. As the areas served by vagal nerve-endings are chiefly distributed on the lesser curvature of the stomach and in the duodenal bulb, both these hypotheses are compatible with clinical findings. In considering the relation of the hypothalamus to the gastric erosion one must also take into account, however, the relation of this area of the brain to the posterior lobe of the pituitary gland. From the work of FISHER, INGRAM, and RANSON[7] on experimental diabetes insipidus it is clear that degeneration, with a loss of the secretory power of the posterior pituitary, takes place after interruption of the nerve connexions of the supra-optic nuclei of the hypothalamus with the pituitary. LIM and his collaborators[8] have had results indicating that stimulation of the central end of the vagus may cause a reflex liberation of the pressor principle from the pituitary. The production of severe acute gastric lesions and chronic ulcers by injecting large quantities of the pressor principle of the posterior pituitary has been reported by CUTTING, DODDS, NOBLE, and WILLIAMS,[9] and the possibility of a hypothalamic-pituitary factor in gastric ulceration is one that cannot be disregarded.

In the light of present knowledge a theory of the ætiology of gastric and duodenal ulceration might be constructed as follows. Acute necrosis of the mucosa results from the action of the digestive juices on tissue that has a lowered blood-supply, the local ischæmia or stasis being caused by the local liberation of acetylcholine or histamine, or by vascular spasm provoked by the pressor pituitary principle. Any factor promoting dysfunction of the hypothalamus might initiate changes that through the vagus or the posterior pituitary would affect the stomach and duodenum. Such a conception would gain support if it could be shown that the emotional strains so often associated with ulceration have a particular effect on the hypothalamus. It would be necessary also to assume that an acute lesion always precedes a chronic ulcer.

FIBROSIS OF THE LUNG AS AN INDUSTRIAL HAZARD

THE recognition of pneumoconiosis as a serious industrial hazard is leading employers of labour as well as government departments all over the world to subsidise research into means of prevention. It must be admitted that so far neither pathologists, chemists, nor physicists have been able to offer much practical help since there is as yet no general agreement on the quantity or composition of the dusts or the size of the particles

[1] Babkin, B. P., *Canad. med. Ass. J.* May, 1938, p. 421.
[2] Beattie, J., *Ibid*, 1932, 26, 278.
[3] Watts, J. W., and Fulton, J. F., *Ann. Surg.* 1935, 101, 363.
[4] Christophe, L., *Scalpel*, April 16th, 1938, p. 491.
[5] Manning, G. W., Hall, G. E., and Banting, F. G., *Canad. med. Ass. J.* 1937, 37, 314.
[6] Necheles, H., *Amer. J. dig. Dis. Nut.* 1937, 4, 643.
[7] Fisher, C., Ingram, W. R., and Ranson, S. W., Diabetes Insipidus and the Neuro-hormonal Control of Water Balance, Ann Arbor, 1938.
[8] Chang, H. C., Chia, H. F., Hsu, C. H., and Lim, R. K. S., *Chin. J. Physiol.* 1937, 12, 309.
[9] Cutting, W. C., Dodds, E. C., Noble, R. L., and Williams, P. C., *Proc. R. Soc.* B, 1937, 123, 27, 39, 49; see *Lancet*, 1937, 2, 698.

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that cause fibrosis, or even on the degree to which infection affects the liability to injury of the tissues.

A few weeks ago Mr. E. J. KING, Ph.D., showed in our columns what puzzling discrepancies are found in the results of studies of solubility of silica and left no doubt of his conviction that a biological approach is essential. But here the discrepancies between recorded observations and deductions made from them are even more pronounced. For example, CHARLES BADHAM and H. B. TAYLOR, in a study of the lungs of coal, metalliferous, and sandstone miners and other workers in New South Wales,[1] conclude from the examination of 32 coal-miners' lungs that "coal dust," as distinct from a minimal amount of free and combined silica it may contain, is capable of producing the fibrotic changes seen in some of them. W. E. COOKE on the other hand expresses the generally accepted view in his statement[2] that "coal dust itself does not cause pneumoconiosis, even after 40 or 50 years of mine life." Indeed coal dust has been regarded by many workers as one of the "inhibitors" admixture with which is held to modify the injurious action of silica on the tissues. Dr. L. U. GARDNER, in the annual report of the Saranac Laboratory for 1937,[3] discusses these "inhibitors" and their possible application in the field of prevention, but gives as reasons for decrying any general reliance on their use (1) the undesirability of increasing the total quantity of atmospheric dust in industry, and (2) the likelihood that some of the inhibitors merely retard instead of preventing the action of silica. Nevertheless he emphasises the fact that the industrial hazard from a mixed dust containing silica is modified by its other components and that an equitable industrial code could thus not be based merely upon the proportion of free silica particles in an atmospheric dust, and even less upon analysis of the rock to be worked. The hazard from each mixture must be evaluated empirically, and it would be unfair in his view to impose penalties upon industries generating dust of low silica content without proof of injury from the specific mixture involved. Though Dr. GARDNER still subscribes to the theory that it is the chemical or physico-chemical properties of silica that are "unquestionably responsible for the injury to the tissues," he does not accept the prevailing view that the action of silica on the body depends on the slow solution of the mineral and the liberation of a toxic colloid. Using the injection technique, which he regards as entirely satisfactory to determine whether various forms of silica or of the silicates (except those of a fibrous nature like asbestos) are capable of causing fibrosis, even though the effects are elicited in tissue other than that of the lungs, he has tested 24 of the silicates commonly used in industry, including some which are more soluble than quartz. These tests have convinced him that, with certain exceptions, silicates as a class are not injurious to the tissues. In this connexion it is of interest that among the field studies described later in his report (p. 15) an analysis of the results of physical and radiological examination of 1300 employees at cement plants failed to demonstrate that the inhalation of cement dust has a significant influence on the respiratory tract.

It is not only these observations on silicates but others on the action of free silica in different forms that have shaken Dr. GARDNER'S confidence in the solubility hypothesis in its simplest form. He reports tests of the solubility of various forms of free and combined silica in water which indicate no parallel between the amount of solution and the capacity to provoke reaction in the tissue, admitting however that water is not the ideal solvent for such comparisons. But it is mainly the differences in the biological activity of different forms of amorphous silica which make him suspect that the physical state of the soluble matter may be of more importance than the amount of silica which is dissolved. Like others he has found that soluble silica in dispersed colloidal state is extremely toxic. In sublethal doses it produces reactions in the tissues which simulate those caused by fine quartz, although they do not persist as long. But Dr. GARDNER has found that if the same specimen of dispersed colloidal silica that has proved so irritating is allowed to stand for a few days it spontaneously gels and that injections of suspensions of the finely ground gel are inert. He concludes that the mere aggregation of the colloidal particles in the original suspension has completely altered the properties of the silica and rendered it harmless. Studies of the possible influence of hydration in amorphous silica are now in progress in his laboratory. Dr. GARDNER'S conviction that many of the silicates have no injurious effect is qualified by the admission that in the presence of infection they may not prove to be entirely inert. Observations recorded by Dr. E. L. MIDDLETON in his Milroy lectures[4] tend to show that in certain states, for example in the presence of tuberculosis, the action of silicates may be modified. And this brings us back to the very heart of the industrial problem, for the infective factor may prove to be the crucial one. Certainly on the Rand and elsewhere the rejection of those candidates for employment who have any signs or symptoms of infection has had excellent results in limiting the incidence of silicosis. Meanwhile if the plight of employers and even governments seeking guidance in other practical measures to prevent silicosis among miners remains largely unrelieved, those in charge of factories in this country will, from July 1st next, be protected from the reproach of inertia by a strengthening of the law under the Factories Act, 1937. Section 47 (1) requires measures to be taken to protect the workers against inhalation of dust where "any substantial quantity of dust of any kind" is given off, and to prevent dust from accumulating in a workroom.

[1] Studies in Industrial Hygiene, No. 19. 1938. Department of Public Health, Sydney, New South Wales.
[2] *Tubercle, Lond.* April, 1938, p. 289.
[3] The Saranac Laboratory for the Study of Tuberculosis of the Edward L. Trudeau Foundation. Report of the Director for 1937. Saranac Lake, N.Y.
[4] *Lancet*, 1936, 2, 61.

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ANNOTATIONS

DECAPSULATING THE PNEUMOCOCCUS

In our issue of May 28th Dr. L. E. H. Whitby reported that a newly synthesised sulphonamide compound, 2-(*p*-aminobenzenesulphonamido) pyridine, has a remarkable action on pneumococcal infection in mice. This drug is now in the early stages of clinical trial, and the first detailed report of its action in pneumonia, by Dr. Maxwell Telling and Dr. W. A. Oliver, will be found on p. 1391. This report is of a preliminary nature, only three cases having been studied, but it contains an observation of great interest, which points to a direction in which future cases may usefully be investigated. This observation is that shortly after administration of the drug, pneumococci in the sputum lose their capsules, a change indicated both by applying appropriate staining methods and by loss of agglutinability by type-specific serum. The capsule of the pneumococcus is its defence against phagocytic attack; stripped of this defence its virulence is lost. That these degraded cocci were indeed those responsible for the pneumonia was proved by mouse passage, as a result of which they recovered their capsules and original type specificity. It may be remembered that an observation corresponding to this was made by Whitby in his mouse experiments; after the fourth hour the capsules of pneumococci in the peritoneum showed degenerative changes and later disappeared. Here therefore is a clue to the mode of action of this drug and at the same time perhaps a contribution to the vexed and more general question of how sulphonamide compounds act on bacteria. In this connexion it is of interest that no less than three years ago—a long time in the brief history of this remarkable form of therapy—Levaditi and Vaisman [1] put forward the hypothesis that Prontosil acts on hæmolytic streptococci by preventing the formation of capsules, thus rendering them susceptible to phagocytosis. This idea, together with allegations that toxin formation is prevented, has not been generally accepted. The capsule of the pneumococcus is much more readily demonstrable than that of *Streptococcus pyogenes*, and future studies of chemotherapy in infections due to this organism should take note of its behaviour. Should this phenomenon of decapsulation be constantly observed it will afford an ample immediate explanation of therapeutic action, but the mechanism by which this change is brought about will still remain to be explained. We have not really got much further than being able to say that these drugs interfere in some way with the activities of bacteria. It is something to be sure that the action is on the bacteria themselves and not a more indirect one; of this the present observation seems to provide further evidence.

LEGAL RISKS OF PROFESSIONAL PRACTICE

Sir Cuthbert Wallace said last week, as president of the London and Counties Medical Protection Society, that about a tenth of the members apply to the society for advice or assistance every year. This gives some idea of the perils to which the medical or dental practitioner is subject; and perhaps an even more pregnant warning was implicit in the observation of the treasurer, Mr. W. M. Mollison, that one case had recently cost the society £7000. The annual meeting of the society was the occasion for a survey of some of the most usual grounds which may lay the doctor open to attack, and others are quoted in the report for 1937. These include, as usual, failure to insist on a radiogram in cases of suspected fracture or alternatively to obtain from the patient written confirmation of his refusal to submit to radiography; absence of records of visits to or from patients or of the exact nature of the treatment given or of the lesion found at examination; technical inaccuracy, however trivial, in the issue of certificates; and discard of the available pieces of hypodermic needles broken during injections. Sir Cuthbert noted that hospital authorities are now insisting that their resident medical officers should join a protection society; and, as an example of the dangers to which medical officers of health are liable, recalled the action of the society in briefing leading counsel on behalf of the medical officer of health for Croydon, who was completely exonerated by the tribunal appointed by the Ministry of Health to inquire into the typhoid epidemic there. The condensed advice set out in tabular form on p. 5 of the annual report is well worth the attention of both doctors and dentists.

HOW DOES POLIOMYELITIS SPREAD?

The general belief is that poliomyelitis is conveyed by direct personal contact, and this is the opinion endorsed by Sir Arthur MacNalty in the review contributed to our columns on June 4th. It cannot be said however that the contagion theory is completely established, and Dr. Lumsden, medical director of the United States Public Health Service, has lately given some interesting reasons for doubting it.[1] The lower incidence of the disease in tropical and semitropical regions and in the more temperate lands adjacent to them has usually been attributed to warm weather being favourable to the spread of the virus, and hence to general immunisation against it. This hypothesis, applied to the United States, has been held to account for the regularly higher incidence in the northern States; but as Lumsden points out, the last three or four years have seen extensive outbreaks in the South. These outbreaks, too, have been remarkably regional in their distribution and it is impossible to say that the disease has "spread along lines of human traffic." For example the epidemic of 1936 in Alabama was almost confined to a limited area in the north-western part, and it is hard to see why, with frequent and general human intercourse, the disease should not have been spread all over the State by carriers. It seems impossible to explain this localisation in terms of susceptibles or meteorological or other conditions. Equally mysterious is the distribution of cases within a locality; for they often appear in separate homes some miles apart without there being any evidence of direct or indirect personal contact.[2] The seasonal incidence is likewise an enigma. Poliomyelitis here differs, as Lumsden remarks, from diseases that have been definitely proved to be contagious and to spread in the secretions or discharges from the noses or throats, and its seasonal distribution resembles rather that of typhoid fever, dysentery, yellow fever, malaria, and typhus fever (caused by rat-harboured infection). He therefore believes that some other hypotheses of spread ought to be developed and worked upon.

[1] Levaditi, C., and Vaisman, A., *C.R. Soc. Biol. Paris*, 1935, 119, 946.

[1] *Sth. med. J., Nashville*, May, 1938, p. 465.
[2] U.S.A. Public Health Bulletin. No. 228.

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For consideration he suggests that the virus may have its usual habitat in the body of some warm-blooded animal, beast, or bird, inhabiting most parts of the world, and that it is conveyed from animal to animal and from animal to man (relatively seldom) by a blood-sucking insect. Perhaps most human beings have a considerable resistance against infection and those who develop the disease have some peculiar diathesis or specific blood condition, or receive the virus from a bite of the infected insect directly into or close to a nerve terminal or nerve-fibre. Lumsden is not concerned to uphold this particular hypothesis; his argument is rather that we are still so much in the dark about the spread of poliomyelitis that any suggestion that does not conflict with established facts might profitably be followed up.

Of the spread of poliomyelitis apparently by contagion and carrier an interesting example is given in an account of the severe epidemic in Victoria last year,[3] reviewed on p. 1080 of our issue of May 7th. A child (X) convalescing in hospital from scarlet fever developed poliomyelitis. The boy in the next cot had moderately severe scarlet fever, but his symptoms suggested more than that, and it was discovered that he came from a house in which another boy had an influenza-like illness; and the brother of this second boy had had poliomyelitis. The nurse who attended the child X on development of his attack complained a fortnight later of pains in the limbs and vague illness and had to go off duty and to bed for a day or two. Among the patients she was looking after at the onset of this illness was a little girl suffering from whooping-cough and being nursed in a cubicle. This child developed poliomyelitis a fortnight after the nurse was taken ill. Here, then, there is a distinct suggestion of a chain of causation: subclinical case→case→subclinical case→case. Observations like these are clearly worth making, but the fact that they have not proved completely convincing in the past justifies Lumsden's plea for exploration in other directions.

ACUTE INTUSSUSCEPTION

THE diagnosis of intussusception is usually, but not always, easy. In England reliance is as a rule placed on clinical methods alone, but in obscure cases accessory methods may be required. Björkroth[4] has used the barium enema as a routine in the last 6 out of a series of 21 cases and has found it very useful. In the typical ileocæcal intussusception the upper end of the barium column stops rather abruptly and is expanded into a wide cup-shaped figure which makes an easily recognisable picture. In the ileocolic and ileo-ileal types the intussusceptum fits less tightly into the intussuscipiens so that the barium is able to run up along the sides of it and the opaque tube thus formed apparently throws a characteristic shadow. Björkroth says that the examination wastes very little time and has no ill effects on the patient. Most surgeons hold laparotomy to be the only safe course to adopt once the diagnosis has been made, but some contend that, as the actual reduction of the intussusception at operation is often extremely easy, it should be possible, especially in early cases, to get the same result by external manipulation, enemata, or the insufflation of air. All these methods have apparently been used with success; the objection to them lies in the impossibility of being certain without actually seeing the gut that reduction has been complete. Even the opaque enema does not provide reliable evidence of complete reduction, especially where the intussusception starts some distance above the ileocæcal valve. Björkroth's conclusion is that the so-called bloodless methods are unsafe by themselves, but may usefully precede operation in that they partially reduce the intussusception and so minimise the intra-abdominal manipulations. In this way the barium enema may serve a double purpose in diagnosis and treatment.

Björkroth does not discuss the alternatives to resection in irreducible intussusception, but records the remarkable recovery of a baby girl aged 4 months after resection of the whole of the colon as far as the sigmoid, together with 6 in. of ileum, and a subsequent ileo-sigmoidostomy. Another irreducible case provided corroboration of the hypothesis that a swollen Peyer's patch may provoke an intussusception in the same way as a neoplasm does, since in the piece of ileum which had to be resected the Peyer's patches were so swollen that they stood out from the surrounding mucous membrane like so many tumours.

MALIGNANT DISEASE OF THE ANTRUM TREATED BY RADIUM

IN the treatment of malignant growths with radium different surgeons are still using widely different technique. Mr. Leslie Powell[1] describes 18 consecutive and unselected cases of malignant disease of the maxillary antrum which he has treated by radium inserted through an opening in the canine fossa. The main mass of growth was removed, sometimes with the aid of diathermy, but radical removal was not attempted. A dose of radium averaging 40 mg. in a single lead container giving 5 mm. screening was placed in the cavity as near as possible to the central position of the growth, and retained with gauze packing for 50–100 hours, giving a dosage of 2000–4000 mg.-hours. This did no harm to any of the patients, but a second application was given in one or two cases and had a bad general effect. Of the whole series, 8 died with growth still present or with recurrence; 3 died without apparent growth, 2 of them within five months, but 1 after three years; 6 are alive without recurrence after periods ranging from three to twelve years; and 1 is well three months after operation. Thus 7 out of 17 have survived three years or more, which must be considered a good result and better than that obtainable by other methods. In this region, surrounded by bone, adequate screening is essential, but there is as yet no agreement as to the best total dose, nor as to the preference between a large quantity of radium over a short period and a smaller quantity retained for a longer one; the radium, too, might perhaps with advantage be divided between several smaller containers.

Other details of this small series may be mentioned. Of the 18 growths 12 were epitheliomata; in only 1 patient were the glands in the neck extensively involved, while 2 others had only a single gland, and Mr. Powell therefore thinks that any routine prophylactic treatment of glands would be wrong. The oldest patient was 72 and the youngest 27; the latter, with an adenocystic carcinoma, as well as a woman of 41, became pregnant during the course of the disease, and in both of them the pregnancy was associated with a very rapid increase of the growth. The younger woman has survived for seven years but

[3] Victoria Health Bulletin. Nos. 51 and 52. July to December, 1937.

[4] Björkroth, T., *Acta chir. scand.* 1938, 81, 5.

[1] *Roy. Berks Hosp. Rep.* 1938, 4, 124.

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has required another treatment after each pregnancy, and finally deep X ray therapy which has caused necrosis and a defect of the cheek.

THE ERYTHROBLASTIC ANÆMIA OF COOLEY

Cooley and his colleagues in 1927 described a particular type of anæmia found in children of Mediterranean stock; it is characterised by a leuco-erythroblastic reaction, a mongoloid facies, splenomegaly, and generalised bone changes.[1] Since then further cases have been described, but almost all in the United States, and it is therefore of interest to have a detailed study of 36 cases observed in Greece by Caminopetros.[2] After extensive radiographic examination of children with many types of anæmia, he believes that the skeletal changes of erythroblastic anæmia are peculiar to this disease; the malformation of the bones of the face, he says, were constant. The mongoloid eye, on the other hand, was present in only 10 patients and in these he was able to trace an admixture of mongol blood, the characteristic eye formation being inherited as a dominant characteristic. Examining apparently healthy relatives of affected persons he noted that many showed signs of a similar dyscrasia in mild degree, in both osseous and hæmopoietic tissues. He concludes that erythroblastic anæmia is probably inherited as a recessive character since it seems to be transmitted by the apparently healthy. One pedigree given covers four generations. A study of the blood groups in affected families leads Caminopetros to suggest that those who bear the disease transmit it only to those of the same group, but he can find no relationship between any particular blood group and the occurrence of erythroblastic anæmia. He claims that a characteristic feature of the blood, not hitherto recognised, is an increased resistance of the red cells to hypotonic saline. Since many severe anæmias show such increased resistance, the value of this particular finding is doubtful, and further investigation is certainly required before it is used to detect latent cases so as to prevent the carriers from having children as is proposed in this paper.

Improvement in the health of one patient after an accidental malarial infection led Caminopetros to deliberately infect 7 other patients. He believes that the malarial attacks thus induced were beneficial.

THE RADIUM INSTITUTE AND MOUNT VERNON HOSPITAL

THE union of these two institutions is now complete. This means two things: in course of time expense will be saved by the elimination of duplicate services, but more important still will be the concentration of facilities for treatment of the sick, the prosecution of research, and the training of radiotherapists. For the moment the work of both hospital and institute will go on as hitherto, but use will be made of the resources of one to supplement those of the other—thus the deep therapy plant at Mount Vernon will be available for all patients. It is intended eventually to concentrate most of the work both on the therapeutic and research side at Northwood, where there is ample bed accommodation and a supply of good pathological and physical laboratories, but to keep the out-patient department and offices in London. Negotiations are taking place between the Medical Research Council and the new body for the continuance of the Radium Beam Therapy Research as a subsidised clinical research unit. Arrangements are also being made whereby Prophit Trust money held by the Royal College of Surgeons for the Radium Institute will be used to provide a comparative test of the relative therapeutic values of radiation produced by a radium beam and that by a 250 kv. deep therapy plant. The experiment has the approval of the radiological committee of the Medical Research Council and of the British Empire Cancer Campaign. In order to ensure as strict a comparison as possible the work will be undertaken by the staff of the Radium Beam Therapy Research.

VACCINATION AGAINST FOOT-AND-MOUTH DISEASE

FOLLOWING up their studies on guinea-pigs, Waldemann and Kobe[1] have now produced a vaccine against foot-and-mouth disease which they have tested on cattle under experimental conditions. Virus is obtained by artificially infecting susceptible bovines through scarified mucous membrane. Twenty-four hours later the infected lymph is collected from the aphthæ which form on the tongue. This lymph is diluted and rendered cell-free by filtration. Aluminium hydroxide is added and this adsorbs most of the virus particles. The high virulence of the adsorbed virus is attenuated by treatment with chemical or physical agents, the exact nature of which is not specified. The resulting vaccine is then examined culturally for the presence of bacterial contaminants and is tested for loss of infectivity on bovines by the subcutaneous injection of large doses of vaccine and by application to a scarified area. No generalised symptoms should follow administration by the scarification route, though subcutaneous inoculation may result in a mild attack of foot-and-mouth disease. The dosage used for immunisation varies from 20 ml. (for calves) to 60 ml. (for large cattle), given subcutaneously. Nearly all the animals thus treated developed an immunity strong enough to enable them to resist large doses of virulent virus applied to scarified mucous membrane two weeks after immunisation. In the subsequent experiments, after the composition of the vaccine had been satisfactorily stabilised, only 3 out of a batch of 90 animals tested for immunity in this way developed symptoms of the disease and these only mild ones. The actual process of vaccination did not give rise to infection in any of these animals, nor did any become carriers of infection either after the vaccination or after the experimental dose of virulent virus. On the other hand, the fact that out of 108 animals vaccinated during the course of still later experiments one did actually develop foot-and-mouth disease as a direct result of the vaccination throws a doubt upon the safety of the method. The authors are fully alive to the importance of this point; they suggest that a few animals may be particularly susceptible to the infection and that the proportion of these will have to be estimated by large-scale investigations carried out under actual farming conditions. The vaccine is now being tested on some 40,000 cattle and the results will be published as soon as they are available. Apparently the only real difficulty encountered in the production of this vaccine is to obtain enough virus-infected lymph, and this will of course be overcome if the in-vitro culture of foot-and-mouth virus without loss of

[1] Cooley, T. B., Witwer, E. R., and Lee, P., *Amer. J. Dis. Child.* 1927, **34**, 347.
[2] Caminopetros, J. *Ann. Méd.* 1938, **43**, 27 and 104.

[1] *Berl. tierärztl. Wschr.* 1938, **54**, 317.

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immunogenic power can be developed upon a large scale.

While vaccine control of this type may bring immense benefit to countries where the disease is endemic, this country will have to await the production of a vaccine which *never* produces foot-and-mouth disease or creates carriers before preventive measures can be adopted with complete safety. The animal export trade of the United Kingdom depends on our freedom from this disease, and nothing short of the drastic if expensive measures now adopted can ensure the maintenance of this freedom. If, however, widespread epidemics could be prevented on the Continent and elsewhere, the likelihood of fresh outbreaks in this country would be greatly reduced and in this indirect way we should gain from the use abroad of a process of vaccination not absolutely free from danger.

THE FINANCING OF UNIVERSITY EDUCATION

ACCORDING to the statistics of the University Grants Committee,[1] based on the returns from universities and colleges in Great Britain which receive Treasury grants on the committee's recommendation, there were in the academic year 1936–37 nearly 50,000 full-time and some 13,000 part-time students engaged on various courses of instruction. Before 1933–34 there was a steady rise in the total number of new students each year, for at least nine years, but since that date there has been an annual fall in the entries, reaching a decline of 423 in the year 1936–37—a reflection, perhaps, of the low birth-rate of the war years. Examination by subject matter shows that the current decrease in the number of full-time students falls on the arts and pure science groups. There were rather more men (254) and a few more women (86) in the medical group which with 13,263 full-time students represented more than a quarter of their total, being the second largest group of all (30 per cent. of male students, 16 per cent. of female). In London this is by far the largest group and amounts to nearly half the total body of full-time students, with 5171 men and 618 women out of totals of 9416 and 3415. Of full-time advanced students—i.e., taking a higher degree or engaged in research—relatively few are in medicine (only 6 per cent.), but of part-time advanced students more than a quarter of the total are occupied with medical subjects. The range of such subjects is naturally very wide. With women advanced students psychology is relatively popular and few are found in medicine and surgery which attract the largest numbers of men. Of all subjects chemistry easily attracts the largest number of male advanced students, followed in order by surgery, history, physics, medicine, law, and economics. With women the order of popularity for higher degrees and research is history, education, English, psychology, botany, and French. Amongst innumerable subjects Anglo-Saxon, Celtic, Buddhism, geodesy, aeronautics, forestry, and astronomy all have their devotees. The total income of the institutions concerned was nearly six and a half million pounds, of which parliamentary grants supplied 36 per cent., grants from local authorities 8·5 per cent., fees for tuition, examination, &c., 31 per cent., endowments 14·8 per cent., and donations and subscriptions 2·4 per cent. It is gratifying to note that these gifts (amounting to £155,370) continue to supplement the contributions of the State and local authorities. Both income and expenditure show a considerable advance on the figures for the preceding year, for 1936–37 was the first year of a new quinquennium with increased allocations from the Treasury (some £227,000). On the other hand the fall in the number of students involved a loss of over £8000 in fees. The increased resources have naturally improved the financial outlook. Of the 59 institutions to which the report relates 10 balanced their accounts, 30 showed a surplus of income over expenditure, and of the deficits only 9 exceeded £1000.

[1] University Grants Committee. Returns from universities and university colleges in receipt of Treasury grant. Academic year 1936–37. Pp. 26. London: H.M. Stationery Office. 1s. 3d.

EPISIOTOMY

Kretzschmar and Huber of the Chicago Lying-in Hospital have summarised[1] 2987 consecutive episiotomies in order to see whether the operation has unsuspected dangers or complications, and also to compare the results of suture with catgut and suture with silk-worm gut. The incision used was mediolateral, and deep enough to cut the superficial fibres of the levator ani. They find that infection of an episiotomy wound is an appreciable though minor cause of puerperal morbidity, its incidence depending mostly on coincident obstetrical operations, and that infection is more frequent, though less severe, when the wound is closed with silk-worm gut than when it is closed with catgut. More interesting, however, than the somewhat negative results of the investigation itself is the information incidentally given about the conduct of midwifery in Chicago. The 2987 episiotomies were performed in 5624 consecutive labours; that is to say, 53 per cent. of the patients were treated in this way—which seems an enormous proportion to us in this country where the incision is rare. It appears that 2166 of the episiotomies were associated with forceps delivery, and this proportion (39 per cent. of the total of 5624) is again very high and would presumably be higher if one added other instrumental deliveries in which episiotomy was not performed. The great majority (1029) were "low forceps" and this form of delivery is evidently used for nearly all primiparæ, since about half the total cases were first pregnancies. In a country where 9 per cent. forceps-rate in hospital is considered high, 39 per cent. comes as rather a shock; yet the wide difference in practice seems to make surprisingly little difference to the results, for the mortality-rate for the institution is 2·1 per 1000 births, and the usual period in hospital is ten days.

Pieri, also writing about episiotomy,[2] thinks that the operation has suffered in repute because it is increasingly performed by medical men who are insufficiently instructed in the anatomy of the part (which he describes in detail), and in the correct technique. He quotes Arthur H. Bill's remark that "we must stop lowering our standards to the level of the untrained man, and must begin to think of training men to do the things which we consider ideal." Routine episiotomy Pieri evidently puts in this category. As regards technique we are told that as a preliminary the perineum should be gently "ironed out" with the liberal use of neutral liquid soap. He says that "care should be exercised here to avoid over-stretching of the parts and too rapid dilatation. The former causes future loss of muscle tone, and damage to the fascia, while the latter favors laceration." But it is hard to see what advantage is gained from substituting dilatation by the operator's hand for dilatation by the fœtal head suitably controlled by the operator.

It is doubtful whether forceps and episiotomy for

[1] Kretzschmar, N. R., and Huber, C. P., *Amer. J. Obstet. Gynec.* April, 1938, p. 621.
[2] Pieri, R. J., *J. Amer. med. Ass.* May 21st, 1938, p. 1738.

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normal cases will ever become so popular here as they are in the United States; for in Britain a far larger proportion of women are delivered by midwives alone. Minor forms of surgical interference do not commend themselves to the doctor working in the patient's own home, with the assistance of one nurse only, and apart from the convenience of patient and accoucheur, there is a strong feeling that any interference, however slight, must increase the risk of sepsis.

THE BIRTHDAY HONOURS

THE distribution of birthday honours among medical men this year shows recognition mainly of outstanding vision, zeal, and competence in administration. The driving force which succeeded in lifting St. Bartholomew's Hospital medical college from cramped quarters at Smithfield to the only site ever likely to be available near the hospital was not only generated but maintained continuously at high pressure by the dean of the college, Mr. Girling Ball, who receives a knighthood. We do not have to move far from Smithfield to the General Post Office to congratulate Dr. H. H. Bashford on a similar honour. While in control of the medical aspect of a great national service he has found time to make valuable analyses of its complex sickness and disability records, besides delighting the general reader with his books and stories. Of the other new knights, Dr. W. J. H. Haslett, J.P., is honoured for political and public services in Middlesex, and Mr. R. B. Wade has fulfilled with judgment onerous duties as president of the Medical Board of New South Wales. The next eight names on our list (see p. 1413) are also those of doctors who have successfully fulfilled important administrative functions abroad and at home—three of them, Mr. Mitchiner, Dr. Fenton, and Dr. Hurdon, actually in London. Of those who coöperate closely with medical workers, Russell Pasha, director of the Central Narcotics Intelligence Bureau at Cairo, becomes K.B.E., and Mr. H. W. S. Francis, director of the local government division of the Ministry of Health, a C.B.; while among the new commanders of the British Empire are Miss Ruth Darwin, a senior commissioner of the Board of Control, and Mr. Louis Fleischmann, chairman of the Royal National Orthopædic Hospital. Chemists and veterinary workers honoured include Prof. T. H. Easterfield, F.I.C. (K.B.E.), Mr. J. J. Fox, D.Sc. (C.B.), Prof. A. E. Robertson, D.Sc. (C.M.G.), and Mr. W. W. Henderson, M.R.C.V.S. (C.B.E.). If medical scientists receive on this occasion less than their usual share of recognition, all will rejoice at the award of the Order of Merit to Sir Arthur Eddington, F.R.S.

HEPARIN AND THROMBOSIS

THE work of the Toronto school on heparin has now gained international recognition, and the public lecture on heparin and thrombosis given by Prof. C. H. Best, F.R.S., at University College, London, on June 14th afforded a welcome opportunity to learn of these investigations at first hand. After describing the earlier work in W. H. Howell's laboratory, Prof. Best traced the progress of the research in Toronto from its start in 1929 to the present time; the first step was the production of a purified barium-heparin compound by D. A. Scott and A. F. Charles, from which pure heparin could be obtained by precipitation with acetic acid after removal of barium by the addition of an excess of ammonium carbonate. In urging the need for standardisation of the product, Prof. Best suggested that one milligramme of this purified heparin, which can be administered intravenously to animals without ill effect, should be accepted as equivalent to 100 units. It had been found that an initial dose of 40 units per kg. bodyweight, followed by continuous intravenous injection at the rate of 30 units per kg. per hour, would prolong the coagulation-time to about thirty minutes. This procedure would prevent thrombosis after mechanical or chemical traumatisation of the veins or coronary arteries in dogs. The formation of white thrombi in a glass or Cellophane arteriovenous shunt could be prevented by similar means. Prof. Best showed a very beautiful film illustrating these experiments.

Compounds of heparin with benzidine and protamine had been produced by his chemical colleagues: the former was partially insoluble and when injected subcutaneously had a prolonged and delayed action on the clotting-time similar to that of protamine insulin on the blood-sugar. The heparin-protamine compound was, however, completely insoluble and inactive and injection of protamine neutralised the effect of previously administered heparin. This neutralisation was quantitative and allowed of the estimation of the amount of heparin in a sample of blood; it had been shown to occur in vitro as well as in vivo, and thymus histone had a similar action. Prof. Best described some experiments which showed that the prolonged coagulation-time of anaphylactic shock in the dog was accounted for by an increase of heparin in the blood; this, together with its universal distribution in the body, supported the view that heparin must be regarded as the "physiological anticoagulant."

The clinical applications of this work were recently reviewed in a leading article in our columns,[1] and this week we publish a paper on the use of heparin in blood transfusion by Knoll and Schürch. They have amply confirmed the work of Hedenius, and have shown that heparinisation of the donor allows blood to be withdrawn and remain fluid for some hours, and that no untoward effects are to be noted in donor or recipient.

Dr. GORDON HOLMES, F.R.S., will deliver the sixth Victor Horsley lecture at University College Hospital medical school, Gower-street, London, W.C., on Tuesday, July 12th, at 5 P.M. He will speak on the cerebral integration of the ocular movements, and the chair will be taken by Sir Cuthbert Wallace. Members of the medical profession will be admitted on presentation of their visiting card.

ON June 11th Mr. A. D. LINDSAY, the vice-chancellor of Oxford University, unveiled a window in the Old Ashmolean Building, which the University has decreed shall now wholly return to its original use as a scientific institute. The window, which is the gift of the Friends of the Old Ashmolean, completes a series on the staircase, and bears the coats of arms of the Mercers', Grocers', and Merchant Taylors' Companies and of the Royal College of Physicians of London, whose gifts to the institution it commemorates. It also bears, as a tribute to his work, the arms of Mr. R. T. Gunther, LL.D., curator of the museum. Dr. Gunther afterwards showed two recent gifts to the museum—one of the first X ray tubes of the Jackson type to be made and the first English microscope to be made on the achromatic principle, used by Prof. Baden Powell and given by his son the Chief Scout. Dr. Robert Hutchison, president of the Royal College of Physicians of London, speaking on behalf of the College, said that the roots of medicine went very deeply into the past. The appliances, apparatus, and drugs used by our predecessors are still of interest, and in some cases a warning.

[1] *Lancet*, March 19th, 1938, p. 677.

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SPECIAL ARTICLES

THE GASTRO-ENTERITIS PROBLEM IN PASSENGER LINERS

BY H. M. ROYDS JONES, M.D. Lond.

THE object of this paper is (1) to put forward certain suggestions as to the causes of gastro-enteritis at sea, (2) to show the possibility of investigation on board ship, and (3) to induce others to work along similar lines.

For the last eleven years I have been employed as a ship's surgeon, making two winter voyages on the run from England to Australia (via the Mediterranean, Suez Canal, and Colombo) and cruising in the summer for three or four months a year to all parts of the Mediterranean, Canary Islands, Norway, and the Baltic. It has happened that a larger number of cases of gastro-enteritis has come under my observation during this time than is usually encountered in a much longer period. More than 1000 cases have been seen, and these may be divided into three groups :—

I. The sporadic cases arising among passengers and crew during a voyage, usually on reaching or leaving a hot and humid climate.

II. An intermediate group of sporadic cases of illness caused by eating food ashore.

III. Acute epidemics, often affecting only a section of the community on board, due presumably to salmonella (food-poisoning group) or bacillary dysentery infection, from some article of food or drink.

Group I.—In a voyage through the tropics, about 20 cases outward bound and a similar number homeward may be regarded as normal, in a ship's complement of approximately 1000 passengers and 500 crew. Occasionally the numbers are considerably higher.

This is the least satisfactory group, for very little is known about it. The cases are mild and vomiting only occurs in about a third of them. Often the patients do not report sick at the beginning of the illness, and so far the few bacteriological investigations of the fæces I have carried out have not revealed the presence of any salmonella or dysentery organisms. The commonest history is that the patient (*a*) has been drinking much iced water or iced drinks, (*b*) has become chilled by sitting about in the comparative cool of the evening after perspiring freely at deck games, or (*c*) has been exposed to fans, or forced draughts from the punkah louvre system, blowing at night on the insufficiently protected abdomen. Ordinarily no one food such as salads has been consumed by all those affected, and often there has been no direct contact between them. Drinking-water, which was suspected at first, is now believed not to be responsible, partly because cases are so few and are not related to any particular water taken aboard en route, and also because it has been shown (Royds Jones 1936) that *B. coli* (and therefore presumably dysentery organisms) present in water die out rapidly when stored in ships' tanks in the tropics.

Crombie (1892), Hawley (1927), Kligler (1936), Manson-Bahr (1935), Mills (1930), and Rogers (1921), discussing "hill diarrhœa" and diarrhœa in hot climates, all lay stress on the association of a high temperature with high relative humidity, usually accompanied by exposure to chill, with or without a high altitude. When it comes to an explanation of the cause, however, these authorities differ.

Mills suggests that the disorder is due to a depression of the suprarenal gland in an attempt on the part of the body to reduce heat-production. Kligler states that these climatic conditions lead to changes in the intestinal tract which favour the development of saprophytic and pathogenic members of the *coli*-typhoid group, and also that there is a constriction of blood-vessels and a leucopenia in the splanchnic area. He shows that, with the same dose of *Streptococcus enteritidis*, the mortality among mice kept at a high temperature and high humidity is three times as great as it is at the same temperature and low humidity. The same relationship of high humidity and temperature to diminished resistance to infection was shown by Robertson and Weld (1932) working with rachitic rats. Huri (1933) describes the isolation of a vibrio in some cases of summer diarrhœa in Damascus.

Group II does not really come under the heading of gastro-enteritis at sea, for it is caused by consuming contaminated food ashore, and can only be avoided by not eating food—especially salads and uncooked fruit—or drinking water at suspected ports.

Group III is the most interesting and promising for investigation. Three outbreaks have occurred in ships in which I have been serving, and I hope that an account of them may be useful to others who have to cope with similar happenings.

THE FIRST OUTBREAK

On the night of Sept. 30th and the morning of Oct. 1st a few years ago 85 cases came under treatment, but there were many others who did not report sick. The symptoms were vomiting and diarrhœa, sometimes with collapse. A few patients were so ill that they not only fainted while at the lavatory but cut their heads in falling, although the ship was steady at the time. Later a few had temperatures up to 102° or 103° F., but 80 to 90 per cent. were afebrile and recovered within three days. All the patients—comprising officers, stewards, and first-class passengers—were served from the first-class galley. No third-class passenger, or member of the crew served from the crew galley, was affected at this period. This pointed to infection in the first-class galley from (*a*) some article of food contaminated with bacteria or toxin, (*b*) some metallic poison in the cooking utensils or fresh-water system, or (*c*) bacterial contamination of the water in the pipes or ice-tank. The general water- and milk-supply could be considered above suspicion owing to the limited distribution of the cases.

Samples of water, lobster (served at the previous lunch), vomit, and fæces were handed to bacteriologists at Gibraltar and another Mediterranean port for investigation. No metallic poisons or food-poisoning organisms were found in the vomit, fæces, or lobster, either at these two ports or at Cairo. Both Gibraltar and the other Mediterranean port reported *B. coli* in samples of water in quantities from 0·5 to 2 c.cm.—a much greater contamination than is normally found in ships' tanks (Royds Jones 1936). In spite of this, water was absolved from blame as the investigation proceeded.

The majority of patients had both eaten lobster and drunk water, but 5 had done neither. Further investigation, however, revealed that the lobsters

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were taken on board alive in England on Sept. 29th (the day before the epidemic started), cooked the same day for about half an hour in boiling water, and that among the cooks who prepared them, and had eaten portions, one had been unable to resume duty next day owing to gastro-enteritis and another had suffered from the same complaint when preparing the lunch on Sept. 30th. It therefore appeared feasible that the latter cook infected other dishes served at this lunch, which would give a possible explanation of the illness of the five patients who had not eaten lobster.

As soon as time could be spared from the urgent treatment of patients, Petri dishes of Conradi-Drigalsky media were prepared, and an attempt was made to recover the organism from the stools of the more acute cases. In all, the stools of 22 patients were examined, without finding any lactose-non-fermenting colonies which were agglutinated by the sera for paratyphoid B or Flexner or Shiga dysentery. Unfortunately, although an attempt was made, no serum for the agglutination of *B. enteritidis* could be obtained.

By this time a wireless message had been received from the city analyst at Gibraltar saying that "lobster was positive for feeding experiments for vomiting and diarrhœa." It was therefore decided to make some further investigations on these lines with the remainder of the suspected lobsters.

Two female twin cats were purchased at Port Said, and these were kept rigidly isolated in one of the ship's hospitals and fed on sterilised milk. They remained healthy for five days, and on Oct. 16th Cat A was given a portion of lobster for breakfast and Cat B was kept as a control on sterilised milk. Twelve hours later Cat A developed diarrhœa. On Oct. 17th Cat B, which had remained on sterilised milk, vomited once, but this may possibly be ascribed to contamination by the excreta of Cat A, for at this period they shared the same sand-box.

On Oct. 19th and again on the 20th Cat B was given a different lobster, but remained healthy. (Perhaps not all the lobsters were infected.) On Oct. 23rd Cat A, which had previously become ill, was given a portion of another lobster and the remainder was returned to cold storage for subsequent experiment with Cat B. Cat A became listless about two hours after eating the lobster, and twelve hours later had vomiting and diarrhœa. Its temperature (taken under its leg) rose to nearly 105° F., while that of the control cat remained between 98·4° and 99° F. Cat A died on Oct. 25th, whereas Cat B, which had been completely isolated from its sister and fed on sterilised milk, remained healthy. On Oct. 26th Cat B was given the remainder of Cat A's lobster, which had been kept in cold storage for that purpose. The same evening its temperature rose to 101·4° F. and it had diarrhœa; subsequently it completely recovered.

That lobster does not of itself cause illness when given to cats was shown by the fact that Cat B ate it on two occasions with impunity.

Four months later, on inquiry at Gibraltar, it was learned that the feeding experiment, reported by the city analyst, was quite unpremeditated. One of the lobsters landed for investigation was reboiled by a laboratory attendant for half an hour and served at supper to a party of five. Two of these developed vomiting and diarrhœa twelve hours after ingestion. This eliminated at once both the possibility of a chronic carrier in the galley staff and also the ship's water as the primary cause of the epidemic.

After the original acute outbreak on the night of Sept. 30th further cases came under treatment, bringing the total from 85 to 152. Some of these later cases occurred in parts of the ship other than those served from the first-class galley, and were probably accounted for by cross-infection from lavatory seats and feeding utensils contaminated by acute and convalescent cases.

The *conclusion* arrived at was that this outbreak was due to lobster served at the first lunch on board, which would give an incubation period of 10–22 hours. The organism responsible was never recovered, but it was thought probable that a live organism and not a toxin was the cause, in view of (1) the length of the incubation period, (2) the five original cases which did not have lobster, but which may have eaten a dish infected by one of the cooks who was himself suffering from the disease at the time, and (3) the fact that the disease continued to appear after the lobster had been removed from the menu. The way in which germs in lobster might escape being killed by cooking was not demonstrated until the third outbreak, reported below.

A chronic carrier on board, contaminating the lobster after cooking, could be excluded firstly by the Gibraltar feeding experiment, and secondly by the fact that no carrier was found among the galley staff at a subsequent examination by Dr. A. H. Tebbutt, bacteriologist in Sydney, Australia.

THE SECOND OUTBREAK

This occurred when cruising in the Mediterranean and differed from the other two epidemics in that the food on the ship could not possibly be held responsible. It should therefore really be classified under Group II, but, in view of its epidemic nature, it is described here for convenience.

A party of nearly 200 passengers disembarked at one port, rejoining the ship at another thirty-eight hours later. With the exception of 3 sporadic cases, no gastro-enteritis occurred on board among approximately 100 passengers and 400 crew, whereas it was estimated that three-quarters of the 200 passengers on the overland excursion suffered from this disease, with symptoms ranging in severity from a feeling of abdominal discomfort to acute vomiting and diarrhœa, and in 3 cases pyrexia up to 102° F. The members of this excursion stayed at different hotels ashore and the only meal common to them all, before the first cases occurred, was the lunch served on the train after leaving the ship. Only 31 patients actually came under medical care on their return, the others having completely or partially recovered.

This epidemic was noteworthy for the fact that 3 patients were dangerously ill. One of them died, owing to the complicating presence of old nephritis, this being the only death directly or indirectly caused by gastro-enteritis in a series of approximately 1400 cases. Another patient became comatose and unable to take any food or fluid by the mouth, and had to be given glucose saline intravenously for four days; he improved and was landed convalescent, but afterwards relapsed into a similar state from which he gradually recovered. The third patient, although seriously ill, was landed convalescent in England five days later.

The outbreak occurred when there were no suitable media available for its investigation, but a few days later a supply of Endo agar was obtained, and the fæces from 4 cases were plated-out on board. Great difficulty was experienced in isolating a lactose-non-fermenting colony uncontaminated with *B. proteus*, and no pure colony giving sugar fermentation and agglutination reactions for salmonella or Flexner,

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Shiga or Sonne dysentery was isolated. Prof. J. W. H. Eyre was a passenger on board at the time, and very kindly saw some of the patients in consultation, and advised as to the bacteriological investigations. He also took up to London, at the end of the cruise, three specimens of fæces and three of blood, and eventually, after much replating to obtain pure colonies, succeeded in isolating the *B. enteritidis* from the fæces of one case. The blood-serum of this patient was negative to agglutination tests, but as he had suffered from pernicious anæmia he was possibly incapable of forming antibodies to a bacterial infection. The blood-sera of the other two cases gave complete agglutination of *B. enteritidis* in a dilution of 1 in 50, and a partial agglutination at 1 in 100, but were negative to Shiga, Flexner, Strong, V, X, and Y, and Sonne dysenteries.

THE THIRD EPIDEMIC

On a cruise to Norway 49 cases of gastro-enteritis were treated, comprising passengers, officers, and stewards, all of whom were served from the first-class galley. No member of the crew, served from the crew's galley, was affected.

The symptoms were fairly mild and consisted of vomiting, diarrhœa with profuse watery stools (in 2 cases containing a little blood), shock with subnormal temperature, and colicky abdominal pain occasionally accompanied by cramp in the legs. Nearly all cases were apyrexial and the highest temperature was 99·8° F.

The fæces of 7 patients were plated-out on Conradi-Drigalsky media and 5 showed lactose-non-fermenters, in several cases in almost pure culture. These were studied as regards motility, Gram stain, fermentation of lactose, saccharose, mannite and dulcite, and agglutination by Flexner and Sonne dysentery and polyvalent salmonella sera. The results were very disappointing after such promising plates, for no organism of the dysentery-food-poisoning group could be identified. The best plates were later handed to Prof. Eyre, who confirmed the absence of any pathogenic organism.

An inquiry into the diet of patients showed that the only common food was lobsters. These were taken on board alive in Norway, cooked in boiling water the same day for an average period of forty minutes, and served for lunch the following day, without being frozen. No evidence could be obtained that any member of the staff employed in the preparation of the lobsters suffered from gastro-enteritis, either at that date or for some months before it. During the serving, after removal of the shell, the lobster bodies were split longitudinally, the intestinal tube was removed with the fingers and the body cut up, being held by the hand at the time. It seems clear that, should the process of cooking be insufficient to sterilise the intestine, the latter might infect the fingers of the cook during its removal and the germs be transferred in this way to the lobster flesh, when the latter was handled.

To investigate the possibility of the intestines not being raised to a sufficiently high temperature through the carapace and flesh to become sterile during the forty minutes' boiling, the intestinal canals of six cooked lobsters were dissected out with sterile instruments, minced in a sterile Petri dish, and added to two broth tubes. After incubation these were plated out on Conradi-Drigalsky plates, and from both of these *B. proteus* and *B. coli* were recovered. Prof. Eyre later repeated this experiment with six more of these lobsters, investigating each intestine separately; he recovered *B. coli*, *B. proteus*, and *B. lactis aerogenes* from three, while the remaining three proved sterile.

These experiments prove that the forty minutes' boiling to which the lobsters had been subjected was not always enough to ensure sterility of the intestinal canal. If the lobster had been feeding recently on water or sewage contaminated with salmonella or dysentery organisms, this would be an obvious source of infection. After catching lobsters in traps it is customary in many countries to store them in cages or tanks in considerable numbers in readiness for sale. As the cage is kept submerged in the sea within easy reach of the fishermen's homes, the possibility of infection by sewage effluent must be considered. It seems advisable that the position of storage tanks in relation to sewage effluent should be carefully investigated before lobsters are purchased in the large numbers required for passenger liners.

Faidherbe (1904) calls attention to food poisoning due to lobsters, and describes 3 cases, of which the first 2 appear to be typical cases of food poisoning. La Favre (1930) reports a small outbreak of gastro-enteritis among the crew of the U.S.S. *Patoka*, following the eating of crawfish. This outbreak is particularly interesting because some patients ate the fish at restaurants ashore and some on board, and it seems probable that the crawfish were contaminated at the source. Stcherbak (1907) describes a case of gastro-enteritis followed by polyneuritis after eating lobster. No bacteriological or serological investigations were described in any of these cases.

SUMMARY

1. On experience gained in the treatment of over 1000 cases of gastro-enteritis at sea these have been classified into three main groups: (I) sporadic cases usually associated with sudden changes of temperature and humidity, (II) cases due to infection from the shore, and (III) epidemics arising from infection on board ship.

2. Of three major outbreaks here described two were due to consumption of lobster. It is shown that the intestinal canal of this crustacean is not of necessity sterilised by forty minutes' boiling, and the flesh may become infected from the intestine during preparation for table.

3. Lobsters may become contaminated during storage in sea-water before sale, and great care should be exercised as to the site of storage tanks.

I should like to take this opportunity of expressing my thanks to the managers of the shipping company by which I am employed for every assistance in sponsoring investigations ashore and providing media and apparatus on board; to Prof. J. W. H. Eyre for his kindness and courtesy during these investigations; to Mr. G. F. Home, librarian of the Royal Society of Medicine, for references to the literature; and to Group-Captain H. A. Treadgold for his helpful criticism.

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LISTER INSTITUTE OF PREVENTIVE MEDICINE

THE number and variety of investigations in progress at the Lister Institute cannot be adequately estimated by any such process of sampling as might indicate the ore in a mine. The annual report contains as usual highly condensed accounts of studies undertaken by members of the staff and attached workers. From these we have selected for notice a few which might escape attention of medical men glancing through the report, but may have a bearing by no means remote on clinical medicine. The annual report differs from previous ones in that the classification adopted is according to subject rather than to the department in which the work has chiefly been carried out, and this has a great advantage in maintaining continuity and avoiding overlapping.

STUDIES ON VIRUSES AND SERA

The problem of the ætiology of rheumatism has been studied by Dr. G. Hardy Eagles, Dr. P. R. Evans, Dr. J. D. Keith, Mr. A. G. Timbrell Fisher, and Dr. W. H. Bradley, working on the agglutination of virus-like bodies from cases of rheumatic fever, rheumatoid arthritis, and chorea. Sufficient cross-agglutination had occurred to warrant the postulation of a common group antigen suggesting some intimate relation between the causative agents of this group of diseases. The relation of various phases in the clinical course of joint disease, both rheumatic and non-rheumatic, to the agglutination reaction is being studied at Addenbrooke's Hospital, Cambridge, by Dr. Bradley. A higher proportion of positive agglutinations has been recorded during the first attack in cases of rheumatic fever and rheumatoid arthritis, and positive results are more frequent in these than in other joint diseases. Attempts to infect animals with suspensions from pericardial and joint effusions, alone or in combination with streptococci and streptococcal toxin, have not produced the typical lesions of rheumatic disease, although some suggestive clinical states with abnormal electrocardiographic and histological features have been produced in monkeys.

Prophylactic inoculation by the intradermal route of suspensions of elementary bodies of vaccinia has been tried by Dr. D. McClean on groups of nurses in coöperation with Dr. R. G. Henderson (L.C.C.); the local reactions have been slight and general reactions negligible. The resulting immunity has been tested by attempts at lymph vaccination and it appeared that a single injection of a suspension active at a dilution of 1 : 10,000 in the rabbit skin had not been quite sufficient to produce a solid immunity in all the nurses. A virus potent at 1 : 100,000 is now being tried and if the results are satisfactory a series of observations on children will be undertaken.

Much work has been done also on the physical properties of elementary bodies; the metabolism of vaccinia virus; and methods of preparation, filtration, and preservation. The proliferative tissue reactions to two rabbit viruses, myxomatosis and fibroma, studied by Sir John Ledingham, F.R.S., the director of the institute, are, as is pointed out in the report, of extreme interest for the light that they may throw on primitive blood-vessel formation and the cell changes in inflammatory processes.

Mr. D. W. Henderson, Ph.D., has confirmed the claim that mucin enhances the lethal action of the typhoid bacillus in experimental infection in mice. When mucin is added, the number of organisms in an average lethal dose of a virulent strain may be reduced from 7·5 million to 500. This method has been used to assess the value of Vi and O antibody against infection with fully virulent and relatively avirulent strains. The experiments have shown that 20 to 50 times more antibody is required to protect against infection with relatively avirulent than against that with fully virulent strains.

BACTERIOLOGY AND IMMUNOCHEMISTRY

Dr. Henderson and Mr. W. T. J. Morgan, Ph.D., have extracted substances from *Bact. typhosum* corresponding to the Vi and O antigens in a form apparently free from protein. Either or both of the antigens might be found in the extract, depending on the strain chosen, and a preliminary examination indicated that the O and Vi antigens exist in the intact bacterial cell as distinct and separate chemical entities with strictly specific immunological properties. A. H. Rosenheim had previously found that the H and O agglutinins to *Bact. typhosum* produced in horse immune serum differed in their reaction to pepsin and trypsin, those present in the early stages being destroyed by the proteolytic enzymes while those present at later stages were resistant. Mr. S. W. Johnson, Ph.D., is now investigating the possibility of preparing diphtheria antitoxin which would be resistant to peptic digestion.

The curative action of tetanus antitoxin in man is not regarded as being sufficiently potent to reduce the fatality-rate to any marked extent, although statistical evidence indicates that specific treatment is capable of saving life. Dr. G. F. Petrie has shown that in guinea-pigs and mice the therapeutic effect of antitoxin given intravenously is proportional to the time of its administration, and that a neutralising action is apparent when it is given as late as one-third of the survival period of the control animals, all of which died within 90 hours.

It had been suggested that the serum prepared at Elstree against the venom of Egyptian scorpions might be found to neutralise the venom of spiders of the genus Iatrodectus which are common in the Cape Province and whose bite is responsible for serious symptoms and occasional fatalities. Dr. Petrie has found in mice that although a specific serum neutralises the venom of Egyptian scorpions, it does not neutralise the venom of the South African spiders, *Latrodectus indistinctus* and *L. concinnus*, nor apparently does it neutralise the venom of South African scorpions.

The Vi reaction in the serum of chronic typhoid carriers has been found by Dr. A. Felix to be very high and to be independent of the well-known intermittency of the excretion of bacilli. Though the serum cannot serve as final proof of the carrier condition, it has been found in recent outbreaks that the Vi reaction is of definite value in revealing the true carriers, whereas H and O agglutination are of little if any use.

ENDOCRINOLOGY.—HEREDITY AND RESISTANCE

Prof. Korenchevsky with Miss K. Hall and Mr. R. Burbank has continued the study of the bisexual and coöperative activity of sex hormones. He has found that, in addition to physiological effects, the hormones, especially when used in excessive doses, produce pathological changes both in the sexual and other organs in the rat. He cites, among these, gigantism produced by testosterone propionate, and a metaplasia of the uterine epithelium produced by

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large doses of œstrogens. The changes were suppressed if progesterone were given simultaneously with the œstrone.

A sarcoma which was specific for a "pure line" (obtained by brother-sister inbreeding) of albino mice, and regressed when inoculated into members of other strains, was found by Dr. P. A. Gorer to grow in hybrids from a strain of resistant black mice only if they inherited an antigen from their albino ancestors; the antigen was detectable in the erythrocytes.

THE ACCESSORY FOOD FACTORS

Miss E. M. Hume, as secretary of the vitamin-A subcommittee, has organised a collective investigation into the spectrographic and biological methods of vitamin-A content; ten laboratories collaborated in this and the result of the experiments was to confirm the opinion already held by some workers in U.S.A. that the value of 3000 international units of vitamin A per gramme ascribed to the U.S.A. reference cod-liver oil is too high, the exact figure being more nearly 2600 units per gramme. A great many oils and concentrates have been tested against the reference oil and a source of discrepancy has now been removed. Mr. A. R. Todd, D.Sc., and Mr. F. Bergel, Dr.Phil.Nat., have followed up their work on the synthesis of vitamin B_1 with the synthesis of a number of its analogues to determine the group essential for physiological activity. The work by Mr. T. F. Macrae, Ph.D., Miss C. E. Edgar, and Dr. M. El Sadr on the vitamin-B_2 complex has brought good prospects of isolation in the pure state of the dietary essentials in this complex other than lactoflavin.

When *l*-ascorbic acid is allowed to remain in contact with diphtheria toxin for some time in vitro the latter loses its toxicity and some workers had claimed that guinea-pigs receiving an abundance of vitamin C in their diet were more resistant to the effect of diphtheria toxin. Mr. S. S. Zilva, D.Sc., working with a range of vitamin-C content in the plasma from severe deficiency to thirty times that of a guinea-pig fed with it in abundance, was unable to observe any difference in the response of the animals to the toxin doses employed.

Dr. Zilva has obtained results, using the crystalline compound citrin, which suggest that the effect on vascular permeability attributed by Szent-Györgyi and his co-workers to "vitamin P" was probably due to the contamination of the compound with traces of *l*-ascorbic acid.

Miss Hume and Miss H. Henderson Smith have obtained results indicating that certain symptoms observed in female rats—failure to produce or rear living young—were due to a partial and not to a total deficiency of vitamin E. The results contribute to the growing body of evidence that vitamin-E deficiency in rats is not a mere laboratory curiosity, as was long thought from study of the total E deficiency, but that when it exists as a partial deficiency there is much in common between the symptoms shown by rats and those shown by pregnant women with premature separation of placenta or with abortion. The occurrence of pathological symptoms (flaccid paralyses followed by early death) in the young of mother rats insufficiently provided with vitamin E is also confirmed, but no connexion between these symptoms and any condition in human infants has yet been recognised.

NATIONAL COLLECTION OF TYPE CULTURES

The policy of preserving strains of bacteria by means of high vacuum distillation has been actively pursued and all new types are, whenever possible, conserved by that method in addition to or in place of routine subculture. The results have so far been very encouraging and it is hoped that by this technique the routine work of maintenance will be greatly facilitated.

VOLUNTARY HOSPITALS EMERGENCY BED SERVICE

Opening of service.—On Tuesday, June 21st, at 8 A.M. a start will be made with the scheme for providing information by telephone to doctors needing an emergency bed in the London general and special voluntary hospitals, and some further details of its working are now available. At first the office will be open to receive calls only between 8 A.M. and 10 P.M. but the service will ultimately cover the 24 hours.

Notification of doctors.—Doctors living within 11 miles of St. Paul's will be notified by letter of the facilities offered (with the telephone number of the office), but not all at once. Since it is impossible to estimate accurately the number of calls which will be received the letters will be sent out in instalments in alphabetical order, so that their issue can be stopped temporarily if the calls coming in are found to be more than the staff can deal with. Actually this is very unlikely to happen and all the letters will probably be sent out with little delay. For the present at any rate practitioners outside London will not be notified, but it will still be possible for practitioners in any district, including London, to apply direct to the hospitals for an emergency bed.

Scope of the scheme.—About 100 general and special voluntary hospitals have agreed to coöperate and of those which have not the majority are special hospitals where it is held that admission is better carried on under the present system (for example babies' hospitals). Only urgent cases will be dealt with, routine admission being through the present channels, and infectious diseases will not generally be included except through such a hospital as the London Fever Hospital. Although country doctors will receive no official notification, their inquiries will also be dealt with when the first experimental period is over. At first only those doctors who receive a letter should make use of the service, so as not to overstrain its resources while it is feeling its way.

Organisation.—The service will be under the control of the following committee: Sir Harold Wernher (chairman), Lord Luke, Sir Ernest Pooley, Prof. L. S. Dudgeon, Mr. O. N. Chadwyck-Healey, Dr. A. M. H. Gray, and Dr. Geoffrey Evans.

At the central office a staff of 12 female operators will work in shifts of 4 under the direction of the secretary of the service. Most of the operators have worked in hospitals or have been doctors' secretaries, so they will be more or less familiar with medical terms.

Details of working.—The central office will be situated at the headquarters of King Edward's Hospital Fund, at 10, Old Jewry. In the main office each operator will be supplied with a desk and telephone. At one end of the room there will be an indicator board (Fig. 1), 5 ft. by 10 ft., bearing the names of the coöperating hospitals, and opposite each name a row of hooks on which will be hung tickets representing the free beds. The tickets will be of different shapes and colours: a square ticket for a male bed, a round for a female, and a triangular for a child's; a green ticket for a surgical bed, a

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red for a medical, and so on. Thus the operators will be able to tell at a glance what beds are available for any type of patient. This board will be revised twice daily from information obtained from the hospitals, usually between 8 and 10.30 A.M. and between 4 and 7 P.M. The ideal would clearly be for each hospital to report to the office as soon as a case was admitted or discharged, so that the board could be kept always up to date, but this would involve some 1000 calls a day and the cost in time and money would be prohibitive at the moment. Such prompt information would add so greatly to the value of the service however that we may hope that some scheme for its provision may ultimately be devised.

Procedure.—A doctor who wishes to get an accident or acute case admitted will telephone to the office giving his name and telephone number, the patient's name, address, sex, and age, the provisional diagnosis, and the hospital of choice. He can also help the operator by telling her whether the case is medical, surgical, gynæcological, otological, or of other category, and by giving an alternative choice of hospitals to save repeated references to him. These particulars will be entered on a form (Fig. 2); the operator will be able to tell the doctor at once whether a bed was reported free at the chosen hospital at the last revision and if not, accommodation elsewhere can be considered forthwith. When a suitable vacancy has been found the operator will ring up the hospital concerned, and if the bed is still available will book it and inform the doctor, who will be responsible, as at present, for the transport of the patient. With the help of the L.C.C. and St. John ambulance services it is hoped soon to arrange for an ambulance to be booked whenever necessary through the office. At present this will only be possible at those hospitals which have agreed to guarantee the cost. Doctors should always send a letter containing history and other particulars with the patient, but should not usually attempt to get into touch with the house officer direct.

Arrangements at hospitals.—Considerable changes have had to be made at the hospitals in their systems of admitting urgent cases. As a general rule, except for example where the patient is considered to be infectious or quite unsuitable, admission will now seldom be refused, though the hospital authorities will still have the right of refusal, and, of course, may discharge the patient at their discretion. To some extent the hospitals are ceding their rights of admission to outside practitioners, and it is clear that doctors using the service must be highly scrupulous in their selection

EMERGENCY BED SERVICE

DATE
TIME

DOCTOR'S NAME & ADDRESS _____ TELEPHONE _____

PATIENT'S NAME & ADDRESS _____

DIAGNOSIS _____ AGE _____ MALE / FEMALE

HOSPITAL ASKED FOR:

PAY	ORDINARY	PAY	ORDINARY
1		6	
2		7	
3		8	
4		9	
5		10	

HAS CHILD BEEN EXPOSED TO INFECTION ? _____ IS DOCTOR SENDING NOTE ? _____

WILL ADULT ACCOMPANY CHILD ? _____

AMBULANCE REQUIRED YES / NO.

WHERE TO: ABOVE ADDRESS / _____

HOSPITAL RUNG (TIME) _____ BED BOOKED (TIME) _____

AMBULANCE CALLED. SERVICE & STATION _____ TIME _____

DOCTOR ADVISED (TIME AND HOSPITAL) _____

REASON FOR DELAY (IF ANY) _____

INITIALS _____

CHECKED BY _____

FIG. 2.—Form to be used by operators.

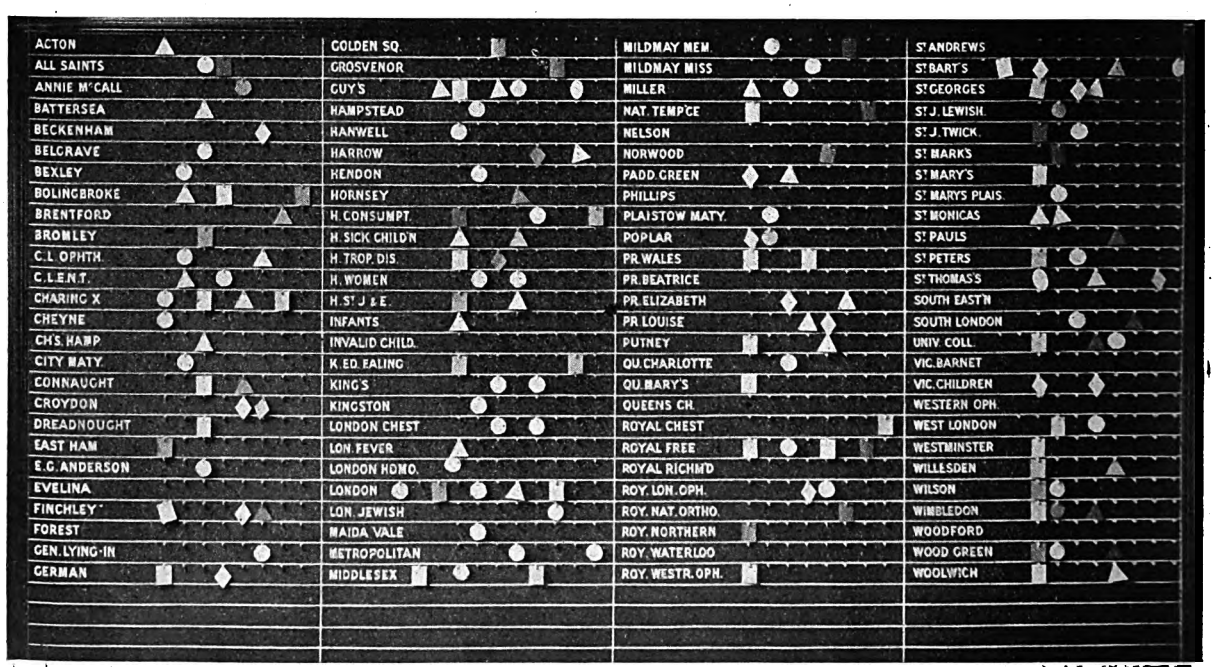

FIG. 1.—The indicator board.

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of emergencies. For instance, the scheme will fail if hospitals find themselves swamped with routine cases sent up with intentionally exaggerated diagnoses: dyspepsias labelled acute appendicitis, or running ears labelled acute mastoiditis. The committee is not attempting to define an emergency—in general it will be a case which requires hospital attention within the day—but there will usually be no doubt in the doctor's mind.

The service must in the first place be largely experimental. It arose from a suggestion made by Mr. A. J. Gardham, F.R.C.S., two years ago. No such scheme has been attempted on a comparable scale elsewhere, and details both at the central office and at the hospitals are likely to require revision in the light of experience. Its ultimate value to all concerned should be immense. There may be some 25 hospitals in London to which a patient might well be sent and the organisation will allow a survey of these to be made in a few minutes. It is unlikely that a suitable bed will not be found in one of these, and the ideal of "one call, one bed" should not be an impossible one to reach.

BIRTHDAY HONOURS

THE honours list issued on June 4th contains the names of the following members of the medical profession :—

Knights Bachelor

William Girling Ball, F.R.C.S.
Surgeon to St. Bartholomew's Hospital and dean of the medical college.

Henry Howarth Bashford, M.R.C.P.
Chief medical officer, General Post Office.

William John Handfield Haslett, M.R.C.S., J.P.
Medical superintendent, Halliford House, Sunbury.

Robert Blakeway Wade, F.R.A.C.S.
President of the medical board of New South Wales.

C.B. (Military)

Maj.-Gen. G. A. D. Harvey, C.M.G., L.R.C.P.I., K.H.P.
Deputy director of medical services, Western Command, India.

C.M.G.

Colonel G. W. Heron, C.B.E., D.S.O., M.R.C.S.
Director of medical services, Palestine.

C.I.E.

Lieut.-Colonel E. H. V. Hodge, F.R.C.P., I.M.S.
Professor of medicine, medical college of Bengal.

Lieut.-Colonel N. S. Jatar, D.S.O., M.R.C.S., I.M.S.
Inspector-general of prisons, Central Provinces and Berar.

C.B.E. (Military)

Colonel Philip Henry Mitchiner, T.D., F.R.C.S., K.H.S.
Assistant director of medical services, 1st anti-aircraft division, Territorial Army. Surgeon to St. Thomas's Hospital.

C.B.E. (Civil)

James Fenton, M.R.C.P., D.P.H.
Medical officer of health for Kensington.

Miss Elizabeth Hurdon, M.D.
Late director of medical services and research at the Marie Curie Hospital.

Augustus Leo Kenny, F.R.A.C.S.
Member of the medical board of Victoria.

James Laidlaw Maxwell, M.D.
General secretary of the International Red Cross Committee for Central China.

O.B.E. (Military)

Major C. B. C. Anderson, F.R.C.S.E., R.A.M.C.

Wing Commander P. C. Livingston, F.R.C.S.E., D.O.M.S.
Consultant in ophthalmology, Royal Air Force.

Surgeon Commander J. A. Maxwell, F.R.C.S.E.

O.B.E. (Civil)

Lieut.-Colonel A. N. Bose, M.B.E., F.R.C.P., I.M.S.
Professor of pathology, Prince of Wales' Medical College, Patna, Bihar.

Mrs. Vera Brown, M.D. (née Scantlebury)
Director of infant welfare, Public Health Department, Victoria.

Miss Isabella Hardie Curr, M.B.E., L.R.C.P.
In charge of the McLeod Hospital for Women at Inuvil, Ceylon.

Prof. R. M. Gordon, Sc.D., M.R.C.P.
Director of Sir A. L. Jones Research Laboratory, Freetown, Sierra Leone.

Walter Haward, M.B.
Assistant director of medical services, Ministry of Pensions.

Robert Best Jackson, M.D., D.P.H.
Malariologist, Medical Department, Hong-Kong.

Lieut.-Colonel L. K. Ledger, M.R.C.S., I.M.S.
Civil surgeon, Peshawar, North-West Frontier Province.

Miss Isobella Younger Ross, M.B.
Hon. secretary, Baby Health Centres Association, Victoria.

Alexander Shearer, M.B.
Medical officer, Department of Health for Scotland.

Robert Yelverton Stones, M.C., M.R.C.P.
Physician-in-charge of the Church Missionary Society's hospital at Namirembe, Uganda Protectorate.

M.B.E. (Military)

Assistant Surgeon E. P. Denton, I.M.D.

Captain John Primrose Douglas, M.B., R.A.M.C.

M.B.E. (Civil)

J. E. R. Heppolette, M.R.C.S., M.C.O.G., I.M.D.
Clinical assistant to the professor of midwifery, King Edward Medical College, Lahore, Punjab.

Lieutenant Ralph Holmes, I.M.D.
Medical officer-in-charge, Victoria Memorial Hospital, Bahrain, Persian Gulf.

Mrs. Teresa Jadwiga Iyer, M.R.C.S.
Director, maternity and child welfare section, United Provinces branch of the Indian Red Cross Society.

Ernest Jenner Wright, M.R.C.S., D.T.M.
Senior medical officer, Sierra Leone.

M.B.E. (Honorary)

Janardan Sitaram Vaidya
Assistant surgeon, medical department, Somaliland Protectorate.

DAWSON WILLIAMS MEMORIAL PRIZE.—The fifth award of this prize, which is given in recognition of work done in connexion with pædiatrics, has been made to Prof. Leonard Parsons for his researches into diseases of children. It will be presented to him by the president of the British Medical Association at the Association's meeting at Plymouth on Tuesday, July 19th. On Thursday, July 21st, at a meeting of the section of diseases of children, Prof. Parsons will deliver the Dawson Williams memorial lecture. He will describe an investigation into some nutritional problems of childhood.

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MEDICINE AND THE LAW

Aneurysm or Tumour?

A DIFFICULT case was recently investigated by the Ilford coroner. The dead man had been treated for lumbago and rheumatism. There was no satisfactory response to treatment. At the beginning of April he began to cough up blood and it was arranged that he should enter the King George Hospital. He was radiographed; a growth on the lung was diagnosed; and it was decided to undertake the formidable operation of pneumonectomy. It was thought that there was a reasonable hope of success, whereas if there were no operation, another hæmoptysis might be fatal. The operation disclosed a large aneurysm. While the surgeon was trying to estimate the extent of adhesion in the lung, his finger penetrated the wall of an artery which had worn very thin on account of the aneurysm. There was an extensive hæmorrhage. Blood transfusion was tried, but it was unsuccessful. The coroner pressed the surgeon with questions about the omission to "screen" the patient in addition to securing radiograms. The pathologist who conducted the post-mortem examination expressed the opinion in his evidence that, if screening had been done, the presence of the aneurysm rather than the suspected carcinoma might have been revealed. This view was also taken by the coroner who said that screening would have shown pulsation in the tumour, in which case the operation would not have been performed. The coroner was satisfied that the surgeon used all possible care in operating to free the lung from the suspected growth. He observed that it was easy to be wise after the event. A verdict of "death by misadventure" was recorded.

While there is no reason to complain of the general fairness of the statements made at inquests, it may sometimes be permissible to suggest that the comments are expressed in an over-simplified form. It is not invariably easy to distinguish between an aneurysm of the aorta and a cancer of the lung. Screening should be of material assistance in doubtful cases, but it was not unreasonable of the house surgeon to form the opinion that the patient was not fit to be moved on account of the possible recurrence of hæmoptysis. Nor is screening an infallible guide. Occasionally the tumour which exhibits pulsation on the screen proves to be a cancer of the lung, while the one which exhibits no pulsation is an aneurysm. The carcinoma may wrap itself round a perfectly normal aorta and transmit its characteristic pulsation. On the other hand an aneurysmal sac communicating with the parent vessel through only a small opening and itself lined by clot an inch or two thick is not likely to show inherent pulsation. If this can occur, screening can mislead. Diagnostic difficulties of this kind throw fresh light on problems often rather summarily disposed of in a coroner's court.

DESTRUCTION OF MOSQUITOES IN AEROPLANES

A TEST FLIGHT

THE transmission of insects by aircraft is important because infected insects might carry tropical diseases such as yellow fever to countries at present free from them. Technically it is by no means easy to ensure that every aeroplane disembarking at an airport is free from live mosquitoes, and in the past two years Imperial Airways Ltd. have been experimenting with different methods.

The regulations of the International Convention for Aerial Navigation require that "disinsectisation" of aircraft shall be carried on under certain circumstances, and the responsibility for it devolves on the sanitary authorities of the various countries through which the aircraft pass. There are obvious objections to this arrangement, for a divided and changing authority is encountered by the aircraft during flight; so the methods of disinfection, the apparatus used, and the insecticide itself, as well as the thoroughness with which these are applied, may all vary from place to place. Apart from forced landings, the plane may refuel at small stations where there is no sanitary organisation and where infected insects might gain access. These and other difficulties induced Imperial Airways to seek a method of disinfection in flight which should come into operation directly the plane leaves an infected area and which could be operated by the crew on taking off. Such a method has been devised and was given a test on June 8th in the presence of Prof. W. W. Jameson (London School of Hygiene and Tropical Medicine), Sir Malcolm Watson (Ross Institute), Wing-Commander D. G. Boddie (Air Ministry), Mr. A. P. B. Page, D.Sc. (Imperial College of Science), Dr. A. J. R. O'Brien (Colonial Office), Major-General Sir John Megaw (India Office), Dr. M. T. Morgan and Dr. N. M. Goodman (Ministry of Health), Dr. J. M. Puri (India Office), Dr. de Boer (Uganda Government), with Colonel F. D. Mackie and other officials of Imperial Airways.

The apparatus used for the freight compartment and less accessible parts of the plane is that devised by Dr. Park Ross, deputy chief health officer for the Union of South Africa, and his adviser, Mr. Larmuth of the South African Fumigation Co. It consists of a small number of jets through which insecticide spray is ejected by the pressure of an ordinary CO_2 Sparklet bulb. The passengers' cabins were disinfested by the same insecticide by means of the Phantomyst nebuliser, an apparatus which gives a dry and exceedingly fine mist, which is in no way obnoxious to passengers. After many tests the insecticide chosen was Deskito, produced by Messrs. Stafford Allen and Co., which fulfils the desiderata required in that it is highly toxic to insects, non-inflammable, not objectionable to passengers, non-staining, and non-corrosive. Deskito is an aqueous-base extract of pyrethrum and for this reason has one great advantage over the paraffin-base insecticides which have been almost universally used previously and which are all to a greater or less extent inflammable.

In the experiment that was conducted on Imperial *Capella* over the Solent on June 8th twelve boxes of mosquitoes were distributed in various parts of the plane, some of them the least accessible. The phantomyst apparatus was started in the rear passenger cabin and moved forward cabin by cabin after periods of about ten minutes in each. The Larmuth sprays were released when the craft took the air. The experiment proved highly satisfactory, for out of the six hundred mosquitoes only one or two appeared to be entirely unaffected and remained alive until the next morning. The rest had died within fifteen minutes or less after exposure. The observers were satisfied that the method used, subject to minor improvements, may well be the method of the future, and Imperial Airways Ltd. hope that local governments will be prepared to delegate to them the authority with which they are invested under the International Convention for Aerial Navigation.

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GRAINS AND SCRUPLES

Under this heading appear week by week the unfettered thoughts of doctors in various occupations. Each contributor is responsible for the section for a month; his name can be seen later in the half-yearly index

FROM A LONDON PRACTITIONER

III

IT is faintly amusing to sketch the not-impossible "Health Talks" that one might deliver, could one but lecture incognito and heavily disguised.

There is the "Sober Life" lecture—the real, indubitable, universally accepted rules of health—the use of the tooth-brush and the well-spent day. The audience goes to sleep. This is not News, it has no Appeal, no Publicity Value. They knew it all before and anyway it is much too dull for practical application. "If the Prophet had bid thee to do some great thing"—"Yes. But go to bed early, brush my teeth, chew my food, walk half-way to my work, cut down my cocktails, tobacco, or stewed tea, stop cleansing the bowels with opening medicine! No. Besides, the man doesn't know what he is talking about." So *that* lecture cuts no ice.

Let me try again with an Isaiah-like outburst against this money-loving, machine-ridden, urbanised society in which we are entrapped. "Getting and spending we lay waste our powers." Materialism and mechanisation are the arch-enemies of health. Away with them, back to a simple life. A very spirited affair and great fun but, of course, perfectly useless and highly unpopular.

Or another, rather like it, but anarchic rather than communistic. "For pity's sake live! Eat what you like and enjoy it; work hard, play hard, sing, dance, go all out, live dangerously. Stop thinking of disease or death, think of living. Read no advertisement, take no medicines, neither eat, drink, nor do anything whatever 'for your health's sake' and keep clear of doctors unless you are ill." This lecture, too, could be delivered from the heart (subject only to the impenetrability of the disguise).

But what of the one they are waiting to hear—the one about nutrition, vitamins, the ductless glands, roughage, auto-intoxication, ultra-violet light, the elimination of toxins, the maintenance of muscular tone in the abdominal wall, about watching for the early signs of cancer and tuberculosis, the dangers of high blood pressure, about Taking Care and the scientific avoidance of disease? The only one of the lot that needs a medical training to deliver. For this one needs no disguise. It is a most popular lecture (or series of lectures). But with what a heavy heart should I, at least, deliver it to those anxious and earnest listeners! Is it not to lecture to the dead about death? Can anything worth calling health come this way? Does not that terrible truth "he that loveth his life shall lose it" overshadow and make nonsense of it all? Can a body of healthy citizens conceivably be brought up by making them what is called "health conscious"? I cannot believe it.

* * *

Health in this country seems to be looked on both officially and unofficially as the state of not being ill, and there seems even to be an idea that it can be secured, or at least promoted, by instilling a fear of disease.

This seems to me to be exactly paralleled by the notion that peace can be secured or promoted by instilling a fear of war, a notion which has been very completely tried out in the last 20 years. As might have been foretold, the results have been disastrous, and I cannot believe that they will be less disastrous or at any rate less futile in the matter of health. It is vain to put it about diligently at the same time that Medicine or Science can control or prevent the disease you are taught to fear. For one thing it is known to be not wholly true, and even if it were true it would not undo the fear. Every new piece of "health propaganda," every "campaign" against a major disease—tuberculosis, cancer, rheumatism, puerperal mortality, or measles—brings with it its wave of fear, the ripples of which punctually and inevitably reach the practitioner's consulting-room. It may be that he gets a distorted impression of the consequences of the propaganda or campaign, perhaps thousands of "early cases" are being controlled which else would have gone on their disastrous way, but the impression he receives is that for one "early case" he sees a score of frightened people whose fear is all too often ineradicable. He exorcises it once, *tamen usque recurret*, and since it has the powerful backing of the official campaign he cannot attack it squarely as fear and suggest courage in its place. It is called "precaution," "coming in time," "preventive medicine"; and

> "Men show their own white feather as proudly as a plume."

Perhaps these people would be afraid anyway, but fear is a disastrous, crippling, and exceedingly common disease, which although its mortality is small must be responsible for an enormous amount of spoiled health, lost time, and vain expense, and it seems a most doubtful policy to give it official support. The balance-sheet of these campaigns can never be made out, but there are very large sums to be placed to the debit side.

* * *

It is terribly apparent that, so long as peace is regarded only as the state of not being at war, is put to no good use, and is desired only for fear of something worse, it will evade us. We cannot have it on those terms.

Will not health also evade us if we seek it by running anxiously to clinics and consulting-rooms and perpetually "asking our doctor"? I know nothing of Herr Hitler's "Strength through Joy" movement, but it sounds a much more likely starter.

* * *

And when all is said and done is there any fundamental reason why a medical man *should* be or should wish to be the expert in health par excellence? Is it not likely that in practice someone whose job it really is to keep himself and others fit—the professional boxer and his trainer, the lieutenant-colonel or even his company commander, an enlightened schoolmaster or mistress—really knows more about it? We need not be ashamed if they do. It really *is* their job, it really is not ours.

None the less, every practitioner does in fact give "health talks" by the dozen. He must. He is

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asked at the start of every illness "What brought it on?" and at its end how to prevent its recurrence. Often enough neither he nor anyone knows and he says so, but if there is any little sermon to be preached the text has been handed to him and he can hardly escape. He is asked how to feed and bring up children, he is set posers in hygiene, dietetics, climatology, immunology, epidemiology, and every other branch of preventive medicine by letter, telephone, and word of mouth, day in and day out. I cannot imagine any kind of family practice in which something of this kind does not happen.

But the plain truth is that, putting aside the ailments due to unhealthy conditions or bad habits universally recognised as such, we have no means of preventing the vast majority of nameable diseases which occur in this country, nor is there any sign that we are likely to possess them either in this generation or the next. The first dozen patients whose names appear in my day-book this year had the following diseases:—

Carcinoma corporis uteri.	Arterial hypertension.
Epilepsy.	Disseminated sclerosis.
Chronic sinusitis.	Cervical "erosion."
Duodenal ulcer, associated diaphragmatic hernia.	Cold in the head.
Acute appendicitis.	Anxiety neurosis.
Lobar pneumonia.	Recurrent petechial rash.

Simple question for "the present generation": Sketch briefly the means you would adopt to prevent or abort the above conditions.

Alas for Science! The ingenuity and efficiency of the machines it has devised for the inhibition of human life at its inception, and for its sudden termination at any time must excite our admiration (especially as "the cause" of life is still obscure), but in the prevention and cure of "all the common diseases" it has a long, long way to go.

PUBLIC HEALTH

Mersey Docks and Merseyside Sewage

THE Mersey Docks and Harbour Board and others concerned in the navigation of the Mersey believed for many years that some, at least, of their difficulties in maintaining sufficient deep water in the estuary were due to the discharge of crude sewage by municipal authorities at various points along the river. This view was, not unnaturally, combated by the sewage authorities. The dispute has recently been settled by an impartial body of investigators.

In April, 1932, the general manager and secretary of the Mersey Docks and Harbour Board and the town clerk of Liverpool, representing the two different interests, made a joint request to the Department of Scientific and Industrial Research to make a full investigation of the effect of the discharge of crude sewage on the amount and hardness of the deposit in the estuary.

The Department agreed to undertake the investigation under certain conditions and entrusted it to the Water Pollution Research Board. The report of the work has recently been issued as Water Pollution Research Technical Paper No. 7 (H.M. Stationery Office, £1 10*s*.).

The Mersey Estuary consists of the shallow Liverpool Bay with large areas of sandbanks, exposed at low water, and a navigable channel. This channel, which since 1890 has been increased in depth by continuous dredging, is connected by about 6 miles of the Narrows, along which extensive docks and important towns are situated, to the large upper tidal basin. From the Narrows to the point where it receives the freshwater of the Mersey and other rivers the estuary is 23 miles long; the average freshwater flow of the system amounts to rather over 1000 million gallons a day with about 40 million gallons a day of crude sewage, discharged direct into the estuary. Both sewage and river water contain suspended matter and the cliffs of the upper estuary, which are boulder clay, are eroded by their joint action.

A general hydrographic and chemical survey of the bay and estuary was made and involved many subsidiary investigations; and the central problems of the origin and properties of the deposit were studied very fully. It was not found that the mud in the estuary itself differed appreciably in composition from that of the Irish Sea and the bay, and the examination of muds collected from relatively unpolluted estuaries of rivers in Great Britain and Ireland showed that the concentration of organic matter or of the elements carbon and nitrogen in the organic matter was of the same order in Mersey muds as in the others. In fact all rivers accumulate much organic matter, as land debris, aquatic vegetation, and dead aquatic animals, which decays and becomes associated with the sand and clay of the mud settling out in places where current speeds are low. The rate of disappearance of organic matter in Mersey mud kept under water was not found to be appreciably different from that of other muds. Evidence based on rates of sedimentation of Mersey and other muds from fresh- or sea-water and from sewage either still or stirred, and on rates of erosion by standard flow of water in an ingenious apparatus devised for the purpose, was collected; and this evidence as well as examination of the finer matter of muds, separated from accompanying sand, showed that the discharge into the Mersey of much sewage had not materially altered the composition or properties of the suspended matter carried in its waters. Hydrographic considerations showed that alterations in the fairway and mud banks of the estuary could be explained by the effect of the natural shifting of the main channel of the river on banks which hitherto had been protected from serious erosion. The conclusion was reached that the crude sewage discharged into the estuary has no appreciable effect on the amount and hardness of the deposits in the estuary. Since one of the conditions of the inquiry was the acceptance of its findings by both parties, the matter is presumably settled. The Water Pollution Research Board and its director, Mr. H. T. Calvert, Ph.D., deserve congratulation on a piece of work which has not only settled a long-standing dispute but is an important contribution to the data and methods of river studies.

Bacteriology of Milk Cartons

Though the risk of disease being spread by people who handle food is nowadays generally borne in mind, the risk of contamination from papers and cartons used as wrappers or containers has had little attention in this country. The May number of the *American Journal of Public Health* includes several articles bearing on this subject, and their main interest relates to the bacteriology of milk cartons. Though the organisms grown from unsatisfactory containers are not pathogens, many of them

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injure milk by interfering with its keeping, by making it unpalatable, and by reducing its food value. On the other hand, the satisfactory cartons that were examined had much lower bacteriological counts than glass bottles, the average being less than ten colonies per container, and the bacteria recovered were of no sanitary significance. It appears that the process of making paper-board can yield an almost sterile product and water-proofing with hot paraffin further reduces the viable bacteria. If the bottles are sealed in the factory where they are made, and not opened until they are about to be filled, the parts that come in contact with the milk need not be exposed to contamination. From a health point of view non-returnable containers have obvious advantages over returnable bottles, and it is therefore gratifying to learn that they can be supplied commercially in an almost sterile condition.

Anthrax from Artificial Manure

At the inquest on June 4th on a market gardener of 30 who died of anthrax in Manchester Royal Infirmary, the jury returned a verdict of death by misadventure, adding a rider that death had been caused by handling artificial manure. The man bought manure from a local manufacturer and scattered some of it on his land with his bare hands. A few days before his death he complained to his wife of severe headaches and she noticed a pimple on his neck. Later his neck swelled and the swelling spread to his chest, and, in spite of treatment in hospital, he died of anthrax septicæmia. The doctor who gave evidence said that the man might have become infected by scratching his neck while spreading the manure, and asked whether anthrax bacilli would not be destroyed in the preparation of manure, pointing out that they were very resistant to heat. Evidence was given that horses, cattle, and occasionally sheep are used to make manure, diseased animals being examined by veterinary surgeons. A representative of the makers of the manure stated that this was made from horses which they slaughtered themselves and the hides and hair were not used. The horses were old and sometimes diseased, and any animal which died suddenly was examined by a veterinary surgeon for anthrax. He agreed that it was possible for an animal to go through the manufacturer's hands without examination.

THE LANCET 100 YEARS AGO

June 16th, 1838, p. 393.

From a lecture on cathartics delivered by Dr. G. G. Sigmond, at the Windmill-street School of Medicine.

IT is often in this that the scientific man demonstrates the superiority of his knowledge; the superficial and inattentive practitioner thinks all purgation alike; he has not that discriminating judgment which enables him to adapt his means to his ends, and here it is that real knowledge is shown, and that the ignorance of the quack, or the foolish love of domestic remedy giving, is displayed. . . .

I do not object to your allowing your patients to pay proper attention to the state of the bowels, and of their own accord occasionally taking a favourite domestic remedy; but it is your duty to point out to them, that what is commonly considered a most innocent medicine may be the source of the utmost harm, if it be taken at an improper moment, or under unfavourable circumstances. You ought to make them aware that the medicines we most generally and apparently unhesitatingly prescribe, are only given by us with safety, because we are intimately acquainted with their modus operandi.

Panel and Contract Practice

Criticisms of the Insurance Service

AT the congress of the Royal Institute of Public Health and Hygiene lately held at Blackpool some outspoken criticisms of insurance practitioners and the insurance service were made by Dr. H. B. Trumper of Imperial Chemical Industries, whose address is reported in the *Manchester Guardian* of June 4th. Every medical man in industrial practice, he said, knows how anxious the sick worker is to receive the best treatment, and how well he coöperates with the medical profession to this end, but though he can have the doctor of his choice he has no guarantee that he is receiving appropriate treatment, for many panel practitioners are "lazy and incompetent." A patient cannot always get specialist treatment without paying a heavy fee, and, although he cannot be certain of a hospital bed in an emergency, yet by paying the fee of a consultant he can be admitted without regard to the urgency of the case. Dr. Trumper thought that the only logical solution lies in a State medical service which could certainly be moulded to provide good and complete treatment without removing the patient's right to free choice of doctor. In his opinion most medical men would welcome the introduction of a scheme which allowed them to practise their craft without fear or favour and where the prospects of promotion depended on personal merit. At present no man of ability entering panel practice could hope to obtain a good income without exploiting the service.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JUNE 4TH, 1938

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 1967; diphtheria, 986; enteric fever, 31 (39 "expected"); pneumonia (primary or influenzal), 919; puerperal pyrexia, 179; cerebro-spinal fever, 29; acute poliomyelitis, 5; encephalitis lethargica, 1; dysentery, 52; ophthalmia neonatorum, 117. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on June 10th was 4108, which included: Scarlet fever, 800; diphtheria, 1014 (carriers 41); measles, 1108; whooping-cough, 268; puerperal fever, 15 mothers (plus 8 babies); encephalitis lethargica, 280; poliomyelitis, 2. At St. Margaret's Hospital there were 26 babies (plus 15 mothers) with ophthalmia neonatorum.

Deaths.—In 126 great towns, including London, there was no death from small-pox, 1 (0) from enteric fever, 20 (7) from measles, 6 (1) from scarlet fever, 13 (2) from whooping-cough, 24 (2) from diphtheria, 42 (15) from diarrhœa and enteritis under two years, and 38 (8) from influenza. The figures in parentheses are those for London itself.

The fatal case of enteric fever was reported from West Hartlepool. In thirteen great towns there was one fatal case of measles, and there were four deaths from diphtheria each at Liverpool and South Shields. Birmingham had five deaths from influenza and Liverpool and Manchester each 3.

The number of stillbirths notified during the week was 310 (corresponding to a rate of 42 per 1000 total births), including 51 in London.

SERVICE AWARDS.—Dr. Edgar Cochrane, medical officer (health), Gold Coast, has been awarded the North Persian Forces memorial medal for 1937 for his paper on tuberculosis in the tropics published in the *Tropical Diseases Bulletin* last year.—Major C. V. Macnamara has been awarded the Alexander memorial prize for 1937. It is given annually to an officer of the Royal Army Medical Corps for professional work of outstanding merit.

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CORRESPONDENCE

RADIOTHERAPY

To the Editor of THE LANCET

SIR,—The annotation in your issue of May 28th on the development of radiotherapy and the fellowship of the British Association of Radiologists raises a question the importance of which is not generally recognised by hospital authorities in this country.

The Radium Commission has had the opportunity of studying the development of radiotherapeutic centres in many parts of the country and has come to the conclusion that satisfactory radiotherapy can only be obtained in a special department where the radiotherapist works in close association with a physicist, as well as with surgeons, gynæcologists, laryngologists, and specialists of other departments.

Developments of radiotherapy in recent years have been very rapid. Only a well-organised department under the control of someone who has the opportunity of keeping himself acquainted with the work that is being done in other centres can hope to give the patients of the department the benefit of the best treatment. The apparatus (radium and X ray) that is needed is expensive both to supply and to keep up. The technical assistance, medical and lay, involves considerable additional expenditure, and the records that must be kept if the work is to be properly controlled are elaborate and need frequent analysis. The demands made on the radiotherapist in charge of such a department leave him no time to earn a living in private practice, and it is improbable the department could be run otherwise than under the control of a salaried officer. If, however, the work is to be done satisfactorily the special training of a radiotherapist and the work that he will do in the hospital should entitle him to a status equal to that of other members of the staff of the hospital, and it is essential that he should have at his disposal beds for the use of patients being treated in the department. In large hospitals it will probably be found that the best work will be done if the radiotherapy department has appointed to it, in addition to the radiotherapist in control and his assistants, a surgeon, a gynæcologist, a laryngologist, &c., who are willing to associate themselves intimately with the work of the department and to learn to carry out the special operations needed for efficient radiotherapy. The idea of such team-work is not new, but a further development of it than is commonly found in hospitals in this country will probably be necessary.

I do not wish to discuss here the question of surgery versus radium. Between those who are familiar with the results obtained by *both* of these there is now little conflict, and they alone are in a position to decide on the method most suitable for any particular case.

I am, Sir, yours faithfully,

GEORGE F. STEBBING.

National Radium Commission, Park-crescent, Portland-place, W., June 10th.

CONVULSION THERAPY IN SCHIZOPHRENIA

To the Editor of THE LANCET

SIR,—In their valuable article on Triazol published in your last issue, Dr. Mayer-Gross and Dr. Walk criticise certain features of the Cardiazol convulsion treatment. In a recent paper [1] Meduna has answered some of these criticisms. He states that he has never witnessed the panicky states of fright so drastically described by some writers, and he attributes these states to faulty arrangement of the cardiazol ward, and to tactless handling of the patient by the physician and nurses. Our own experience has been similar and we have no doubt that fear develops mainly in those cases treated by physicians who are themselves afraid of the convulsions—the physician's fear is communicated to the patient. To-day the cardiazol technique avoids abortive reactions by using doses large enough to ensure a convulsion, instead of using the minimal doses formerly advised. Again, it has been our experience that complete amnesia for the injection is the rule with cardiazol, so that after the convulsion the patient frequently wonders when the injection is to be given. Venous sclerosis is a complication that we believe largely avoidable if pressure is applied to the site of venepuncture, and if moderate skill has been attained. Regarding the rate of injection, 1 c.cm. per second can hardly be called very rapid.

It would be regrettable if the cardiazol treatment were neglected because of avoidable errors, and there is much to be said for a drug that has been proved safe when ordinary care is taken.

We are, Sir, yours faithfully,

HUNTER GILLIES,
E. F. J. DUNLOP.

West Ham Mental Hospital, Goodmayes, Essex, June 12th.

[1] Meduna, L. von, *Psychiat. neurol. Wschr.* 1938, Nos. 8 and 9.

ELECTROSURGICAL OBLITERATION OF THE GALL-BLADDER

To the Editor of THE LANCET

SIR,—Prof. Thorek's letter in your issue of May 21st is based on some fundamental errors which call for a further reply.

I saw Thorek's film in Vichy last year, which he was fair and kind enough to introduce as based on my "pioneer work." This picture made it even clearer to me that the operation he showed—leaving aside the free graft of the falciform ligament—was exactly the one I worked out for cases in which necrosis and perforating abscesses in the gall-bladder wall make it impossible to save the serosa and to perform a routine mucoclasis. I wrote in 1929 in the *Zentralblatt für Chirurgie* that "deep electrocoagulation," the method Thorek claimed in 1933 as his own, is best for such cases. There is thus I think no question of a "new operation," but only the question whether or not to apply this method, regardless of special indications, in all cases, even the most simple. According to my experience there is no reason at all for such a radical and rigid indication. The serosa of the gall-bladder is a defensive and useful tissue, and I believe Thorek is wrong to blame it as a source of recurrent troubles. But of course, when performing a routine mucoclasis, the destruction of the inner layers *down to the serosa* must be complete. The microscopical picture Thorek shows in his communication is typical of an *incorrectly* performed mucoclasis. I discussed this matter in my last letter, so there is no need to repeat it. What purpose can there be in contrasting such an incorrectly performed operation with my radical proceeding?

If I had had the pleasure of having Dr. Thorek in my clinic, like a number of other surgeons who were interested in this method, before he started his experiments, no misunderstanding would ever have arisen. He would also have realised that, for instance, the double-way syringe he describes as "the author's

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syringe," as well as the method of washing out the bladder with an antiseptic before opening, and other more technical details, were in use in my clinic for a long time, and were also adopted by nearly all surgeons who learned and performed the operation years before Thorek did.

When I introduced electrocoagulation of the gall-bladder instead of the former "high-power Paquelin" (1926) I was quite aware that I was not changing the principle of the operation, but only introducing a new method that had many technical advantages, and also made it possible to graduate the effect more easily according to the requirements of the case. No essential microscopical difference in the necrotised and surrounding tissue could be found. In applying my radical coagulation method rigidly for all cases, Thorek does not utilise this advantage of the electrocoagulation.

In his reply to my criticism he quotes me as having said in the *Illinois Medical Journal* that "Thorek's aim is, if I understand him rightly, to destroy all infected parts, the residual infection being one of the main causes of recurrent troubles after operation. . . . Thorek's conclusion seems to be logical." But in leaving out a sentence he creates an impression exactly contrary to what I intended; for after explaining that the liver itself contains micro-organisms in large numbers and must be blamed in the first place for the recurrent bacteriological "troubles," I wrote: "We cannot therefore succeed in any way by electrosurgical means in destroying all infected spots even when we electrocoagulate the whole gall-bladder and the liver bed." I think this makes it clear that the full text has an opposite meaning to what Thorek quotes me as having said. Chronic hepatitis and cholangitis, which Thorek apparently disregards, are indeed the main causes of the recurrent "bacteriological troubles," but never the serosa of the gall-bladder.

Drainage.—My first paper concerning mucoclasis was published in 1928 in the *Zentralblatt für Chirurgie* and was entitled Mucoclasis and Gall-Bladder Surgery *without Drainage*. I referred to 200 cases, all badly infected (empyemas, &c.), in which I performed mucoclasis and closure of the abdominal wall without any drainage, on principle. I realised that it was an experiment, but it was a successful one, as my statistical figures just mentioned prove—i.e., 200 cases without any deaths. I explained in detail the advantages of closure without drainage: only mucoclasis enabled me to undertake it. The procedure was at that time absolutely new and it was several years before colleagues who saw the operation were convinced of its advantage. In course of time, however, my good results were confirmed by many surgeons and I am very glad to learn that Thorek also became a friend of closure without drainage—so ardent a friend indeed that he thinks it necessary to defend my own method against myself.

I have already explained why in the rather rare cases with *B. coli* infection I make an exception. But there are other reasons why one should individualise. Since 1928 I have succeeded in evolving other operative methods, including cholecystocholedochostomy which has proved very successful in cases in which the function of the gall-bladder can be saved. This operation requires drainage through the anastomosis for a few days. There is also the "ether method," which became for us the routine for impacted stones in the papilla, not removable by a simple supraduodenal incision. Here a small drain has to be inserted, sometimes for several weeks; and I have convinced myself that when performing a correct electrosurgical operation there is no danger of cholæmic bleeding. The method has been widely followed and I understand from a personal letter of Dr. Thorek's that he also has adopted this method "with drainage" and has obtained such good results that he is "popularising the method in America." I hope that no misunderstanding will arise on this subject, such as has unfortunately arisen over mucoclasis and the electrosurgery of the bladder.

I am, Sir, yours faithfully,

London, June 2nd. B. O. PRIBRAM.

GASTROSCOPY

To the Editor of THE LANCET

SIR,—Prof. Schindler complains that my phrase about carcinoma of the stomach being "controlled by the office use of the gastroscope" misrepresents his views. If that is so, I apologise sincerely; but the following passages from his book are what I had in mind.

On p. 238 he writes: "Gastroscopy is of great value in the diagnosis of this disease (gastric cancer). My opinion in this regard differs from that of most gastroscopists except Parade but it has become stronger in the course of years." In parenthesis, he might have added that every single German university medical clinic specialising in gastro-enterology and gastroscopy disagrees with this view, and for several reasons which there is no need to particularise they have had better opportunities than he has for reaching a conclusion. On p. 258 Prof. Schindler refers to the success of the campaign against cancer of the female breast and of the uterus, and gives his ideas on the organisation of a similar campaign against gastric cancer. His principal suggestions, apart from exploratory laparotomy, are:

"Both practitioners and laymen must learn that immediate and thorough examination of the stomach by the use of both X-ray and gastroscope is indicated when patients over 35 years of age complain of unexplained loss of appetite, loss of weight or mild abdominal distress. A sufficient number of physicians must be trained thoroughly both in the X-ray relief method and in gastroscopy. Patients in whom an atrophic gastritis or a benign epithelial tumor has been found should be examined twice yearly by gastroscopy and the X-ray relief method. Patients suffering from chronic superficial gastritis should be treated carefully and followed gastroscopically in order to prevent the development of atrophic gastritis, the soil for cancer."

Since some 30 per cent. of persons over sixty show achlorhydria (the same sort of figure is found in different countries: Davies and James,[1] Bloomfield and Polland,[2] Dedichen,[3] Poeschel,[4] Lasch [5]) and since many more show some degree of superficial gastritis, this is a colossal programme and I am afraid I jumped to the conclusion that Schindler thought it would be a profitable one and that some control of cancer would be attained, to set against all the labour, suffering, and anxiety which such a campaign would cause. I attributed this control to the office use of the gastroscope—"office" because it would be impracticable to hospitalise so many persons, and "gastroscope" because, as Schindler

[1] Davies, D. T., and James, T. G. I., *Quart. J. Med.* 1930, **24**, 1.
[2] Bloomfield, A. L., and Polland, W. S., Gastric Anacidity, London, 1933, p. 56.
[3] Dedichen, L., *Acta med. scand.* 1924, **61**, suppl. 7.
[4] Poeschel, R., *Zeit. klin. Med.* 1930, **113**, 379.
[5] Lasch, F., *Med. Klinik*, 1931, **27**, 1031.

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points out, ordinary X ray methods are not fine enough and relief X ray work is unreliable in absence of gastroscopical corroboration.

With regard to the rest of Prof. Schindler's letter, I disagree with his view that the rigid instrument is the more dangerous, but there is no need to argue the matter since he now grants the only point I care about—i.e., that the older instruments were optically superior. It follows that the opinion of men like Gutzeit and Korbsch with twelve years' experience of rigid instruments cannot lightly be set aside on the strength of a few years' work with flexible ones.

The body of the letter deals with points raised in my controversy with Sir Arthur Hurst six months ago.[6] To summarise the position again, no one has yet claimed that achlorhydrics or cases of gastritis are immune from cancer of the stomach. If 30 per cent. of persons in the cancer age have achlorhydria, then at least 30 per cent. of cancer will develop in achlorhydrics. Similarly cancer sometimes develops in known cases of gastritis, but Gutzeit—whose gastroscopical follow-up must be almost unparalleled—has not so far persuaded himself that cases of gastritis are in any greater danger than anyone else; still less that any particular variety of gastritis is a precursor of cancer. Sir Arthur Hurst in his Harveian oration claimed that "abundant and conclusive evidence" existed in favour of his views on the gastric precancerous state, but when I challenged him for disagreeing with so many of the greatest clinics in the world, he gave two references only, one of which appeared to be inaccurate while the other was unpublished. In due course Katsch's referat was published and since it contained no support for Hurst, I journeyed 600 miles across Europe to enjoy the hospitality of the Greifswald Clinic. I now have Prof. Katsch's authority for saying that Hurst has misunderstood his opinions. Katsch finds that as a maximum figure only 4–5 per cent. of gastric cancer comes from chronic ulcer, and like everyone else he has rarely seen an early case of any kind of gastric cancer; the few he has seen were discovered accidentally and as far as he remembers were *none* of them achlorhydric.

The gastroscopist, however bad he is, after following up a patient for a year, can either diagnose a cancer or tell the patient that he is no more likely to get it than anyone else. As there is no clinical evidence that one can predict the probability of a gastric cancer developing, and considerable evidence that one can't, I feel justified in again protesting against the custom of telling a patient with studied cheerfulness that "it's probably all right but it's just as well to keep an eye on it every six months in case. . . ."

I am, Sir, yours faithfully,

Oxford, June 11th. DENYS JENNINGS.

[6] Jennings, *Lancet*, 1937, 2, 1278, 1404, and 1508.

POST-GRADUATE COURSES IN BERLIN.—International post-graduate courses are to be held in Berlin in the autumn on the following subjects: internal diseases in which lives are suddenly endangered (Oct. 3rd–8th); diseases of the muscles and joints (Oct. 10th–16th); hormones and vitamins (Oct. 17th–22nd); tuberculosis (Oct. 24th–29th); diseases of the ear, nose, and throat (Sept. 26th–Oct. 8th); accident surgery (Oct. 17th–22nd); neurotic diseases (Oct. 24th–29th); and homœopathy (Oct. 10th–Nov. 5th). Monthly courses in all branches of medicine, including practical work, can be arranged. Further particulars may be had from the information bureau at Kaiserin Friedrich-Haus, Robert Koch-Platz 7, Berlin, NW 7.

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

PROTEST AGAINST THE NEW MATERNITY SERVICES

AT a meeting of insurance practitioners in Dundee last week a resolution was passed by a large majority to the effect that practitioners in Dundee should refuse to accept service under the Maternity Services (Scotland) Act. One reason expressed for this decision was that domiciliary midwifery under unsatisfactory housing conditions should not be encouraged. The meeting regarded the local authority's present scheme, with changes already being made, as adequate. As regards terms of service, objections were raised to the medical report, which was held to be unnecessarily full and would take a long time to complete. Another objection was to the complaints appeal clause. It was pointed out that it would be necessary to have a complaints committee to deal with complaints and the medical practitioners of Dundee decided that they did not wish to enter a system that is to contain a complaints committee. In certain circumstances, moreover, a doctor in the service would have to attend a case on the direct instruction of the local authority. The fees to be paid were also considered too low—namely, £2 for a non-insured woman and £1 16*s.* for an insured woman. These fees, it was stated, were much worse than under present conditions; even for an insured woman the present fee usually amounts to five guineas.

EDINBURGH MEDICAL INSTITUTIONS

The Edinburgh branch of the British Medical Association have published a useful booklet giving information about medical institutions and other matters on which the local practitioner should be well informed. There are 21 hospitals in or near Edinburgh, many of which have special clinics, and there are also special services for laboratory and diagnostic investigations. The price of the booklet is 1*s.*, and it is to be had from Messrs. George Waterston and Sons, Ltd., 35, George-street, Edinburgh 2.

BUCHAREST

(FROM OUR OWN CORRESPONDENT)

PUBLIC HEALTH IN RUMANIA

M. I. Constantinescu, Minister of Public Health, has recently deplored the absence of any organised instruction of the rural population of Rumania in the elements of hygiene and preventive medicine. In the past this was of less moment, since owing to lack of transport facilities personal intercourse between people living far from one another was rare, and diseases did not spread so easily from one corner of the land to the other as they do now. A few years ago exanthematous typhus cases at Sacueni were traced to gipsies who had migrated from Bessarabia, the other end of the country, and this is typical of the spread of epidemics to-day. Though the health of the urban population is well cared for, the ratio of doctors to the population being 1 : 400, the villages have only a share in the services of official medical officers. In some districts the ratio is 1 medical officer to 15,000 or even 25,000 people; and one who has under his care 15 villages can hardly be expected to give them adequate medical service. The peasants are unaccustomed to pay for such service, and the villages thus

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offer no attraction to doctors in private practice. The birth-rate is favourable in Rumania, but the infantile mortality-rate leaves much to be desired. In some regions many of the babies die in winter from broncho-pneumonia and in summer from intestinal disorders. In the last five years there has been a satisfactory improvement, due to the appointment of well-trained midwives and to the augmentation of the number of doctors. The Ministry of Public Health proposes to establish this year another 150–200 dispensaries; the country people are being educated to attend such dispensaries immediately they feel ill and to submit to isolation if their disorder is deemed infectious. In Bessarabia a disinfestation campaign is being inaugurated. Here the habit of the peasantry is to wear dark-coloured shirts for a month or so without a change, and it is small wonder that they get infested with lice. M. Constantinescu has sent 100 young doctors, serving their six months' military service, to help in the promotion of schemes for delousing and of more hygienic living. He has sent 40,000 white shirts to the area in the hope of persuading the people to wear white shirts and to change these at least once a week. In every Bessarabian village baths and a disinfestation plant have been installed and it is hoped that by these energetic measures public health conditions in Bessarabia will be improved.

Efforts are also being made to cope more effectively with malaria, which is endemic in many districts. Hydraulic engineers have been called into consultation and adequate sums have been allocated for drainage work. The malarial peril is not so great in the Danube delta as in certain other districts. The most urgent problem is the plight of the villages near Jassy, where about 50 per cent. of the population is infected. Last year canalisation and drainage of the valley of Barla, which is a dangerous malarial focus, was begun and it should shortly be completed. Another disease especially rife in the villages of Muntenia and Moldova is pellagra. During the war the soldiers got accustomed to the consumption of wheat-rye bread and other foods, but little by little they returned to the old custom of selling their wheat and subsisting exclusively on bread made of maize. The Government has decided to build big maize dryers to prevent the maize from becoming mouldy, and also to create employment at decent wages so that the people can afford a better diet. Although nearly everyone keeps a cow or a goat, few drink milk. This is a question of education, and school-teachers are now being trained in dietetics in order to pass on the information to parents of undernourished children. The introduction of gratuitous antisyphilitic treatment throughout the country has given excellent results, with a notable reduction of stillbirths. This is of the more importance because in some of the prosperous districts of Rumania, for example the Banate, there is a strong tendency to avoid childbirth or to procure abortion. In these villages the mortality-rate by far exceeds the birth-rate. This social problem is being tackled by the joint action of doctors, the church, the schools, and public administration. Altogether M. Constantinescu appears to be taking a wide view of his responsibilities and using foresight as well as energy in his efforts to improve conditions.

HOSPITALISATION OF SCARLET FEVER

The fever hospital in Jassy, capital of Moldowa, known as the Izolarea, is an up-to-date hospital of 200 beds, with special pavilions and cubicles for patients suffering from common infectious diseases. The hospital is the chief source of clinical material for the teaching of epidemiology and is part of the medical faculty of the university. While the country's average case-mortality rate from scarlet fever varies from 17 to 19 per cent. in recent years, that of the Izolarea is only from 3 to 5 per cent. Though during the 13 years 1924–36, 4817 or 93 per cent. of all scarlet fever cases occurring in Jassy were admitted to the hospital, the number of fresh cases in the city was not diminished, so that some authorities have suggested the shortening of the period (now 40 days) of detention in hospital. School-children between the ages of 5 and 15 form almost 60 per cent. of the total number of in-patients. Complications occurred in about half of the cases, the most frequent being adenitis (suppurative and non-suppurative) nephritis, and middle-ear disease. The complications mostly followed severe clinical attacks, but mild ones were not immune from grave and even fatal sequelæ. Middle-ear disease occurred in 55 per cent. of the mild cases. Streptococcal septicæmia was observed only in 43 cases. Relapses followed in 113 and recurrence of the disease only in 28 cases.

PROFESSIONAL SECRECY

An insurance company was recently sued by a widow for 1,200,000 lei, which it refused to pay because her late husband had supplied false data when he filled up his insurance form. In support of its case the company produced certificates from the attending physicians to the effect that the deceased suffered from a disease at the relevant time, but had concealed this fact. On losing her case and a subsequent appeal, the widow appealed to the Court of Cassation in Bucharest, arguing that the physicians who supplied the medical certificates had violated the law of professional secrecy, thus committing a felony which could not be the basis of a verdict in law. The legal representative of the insurance company referred to legal doctrines, and claimed that only the spontaneously and indiscreet revelation of professional secrets was illegal and not a declaration made before a court by the order of the judges. The Court of Cassation accepted this interpretation and approved the sentence of the Court of Appeal.

TWO CASES OF TETANUS FOLLOWING ABORTION

Mironescu and Bals publish two cases of tetanus following induced abortion. The first case was that of a woman of 31 whose symptoms started 14 days after a septic abortion. She was admitted to hospital seven days later, when she was having 20–25 fits every hour. Altogether she received 4600 c.cm. of antitetanic serum intramuscularly in the next eight days, and 8 g. of chloral hydrate, half by mouth and half by enema. In the second case, a woman aged 29, the first manifestations of tetanus appeared 15 days after the abortion. She was admitted to hospital on the tenth day of the disease with generalised tetanus. The symptoms abated on the tenth day of treatment, during which time she received 6000 c.cm. (3,400,000 units) of antitetanic serum. Both patients recovered. Mironescu and Bals observe that these excessively high doses would not have been required if the patients had been sent to hospital when the first symptoms were noticed.

THE LATE PROF. MARINESCU

Prof. Marinescu, to whose death you referred in your issue of May 28th, will be greatly missed in Bucharest. His illness was short; only two or three weeks before his death he gave a lecture on the life and work of Prof. Babbes, the founder of the first Pasteur Institute in Rumania. His world-wide

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reputation as a neurologist brought fame to our university and his indefatigable work, even in his old age, was a constant source of stimulation to his juniors.

AUSTRALASIA

(FROM OUR OWN CORRESPONDENT)

THE NEW POST-GRADUATE SCHOOL

THE opening of the Prince Henry Hospital as a post-graduate school was performed by the Governor of New South Wales, Lord Wakehurst, on April 5th. This marks the culmination of years of effort by the medical post-graduate committee of the University of Sydney and the hospital board, with the coöperation of the Government. The hospital is at Little Bay, about eight miles from the centre of Sydney. At present it has 750 beds but must be prepared, under its Act, to provide 300 beds for infectious diseases at any time. It has now been organised specially for post-graduate teaching and research and has been divided into three main departments—medicine, surgery, and pathology—with directors appointed by the university. Dr. S. A. Smith is to be director of medicine and Dr. H. R. G. Poate of surgery, both on a half-time basis. Under each clinical director is a unit of 100 beds which is thought sufficient to allow students to participate directly in the practice of the hospital. The hospital board has agreed to provide senior and junior fellowships in medicine and surgery to members of the staff of the units. An honorary staff will also be appointed to assist the units and to carry on the other work of the hospital. The teachers in the faculty of medicine are ex-officio members of an associate staff which will be available at any time for consultation and will help to bring the hospital in close contact with the university department. Further, it will be possible temporarily to attach distinguished medical men to the hospital staff for special purposes.

In his speech at the opening ceremony the Minister for Public Health, the Hon. H. P. FitzSimons, said that the Government had been vitally concerned with two aspects of post-graduate education, the first being the instruction of the newly fledged graduate. The Medical Practitioners Bill, which will be submitted to Parliament during the approaching session, provided that all new graduates must first do one year as a resident medical officer of an approved hospital or clinic before being granted the right to start private practice, but a post-graduate school made it possible for the new graduate, having completed his year as medical officer, to develop his technical knowledge and skill under expert supervision and guidance at an institution specially adapted for this purpose. The second object was the provision of refresher courses for medical practitioners who have already been in practice, particularly in country areas, for some years. The policy of the Government in developing country hospitals and furnishing them with the best and most modern equipment made it essential for the practitioner to have his medical knowledge refreshed at regular intervals and to be taught to use the new instruments and apparatus. He now appealed to the rank and file of the medical profession to coöperate in the advancement of the institution. The great majority of the profession recognised that they had a duty both to teach and learn, and the Government would play its part in providing them with necessary facilities.

PRACTITIONERS AND MIDWIFERY

CALLS UNDER THE MIDWIVES ACT

IN a report on maternal mortality a year ago (Cmd. 5422) medical officers of the Ministry of Health proposed that local authorities, in consultation with the medical profession in their areas, should be empowered to ensure that the best local obstetric skill is made available wherever a midwife is required (under the rules of the Central Midwives Board) to call in a doctor. This proposal aroused criticism (see *Lancet*, 1937, 1, 1116 et seq.) and the Minister of Health has since been in consultation with the British Medical Association, the Central Midwives Board, and the representatives of local authorities. He has now issued a memorandum embodying his conclusions.

It is proposed that in each area a panel of practitioners should be drawn up. The means by which the names should be selected will be for the local authorities to decide, but the Minister suggests that it will usually be best for each authority "in consultation with such local organisations of registered medical practitioners as appear to them effectively to represent the opinions of practitioners in their area," to draw up a list of practitioners who notify themselves as willing to be called in by midwives in an emergency. "It would be convenient to distinguish on the list between those practitioners available for any emergency and those available only for attendance in an emergency arising with regard to their own patients." The list would indicate those practitioners who wish to be available for a limited district only. Practitioners could also be requested to nominate from among those included on the list a deputy to act for them if necessary and provision would be made for revision of the list at frequent intervals to enable it to be kept up to date.

It is also proposed that the authority should set up an advisory committee consisting of the medical officer of health (as chairman) and two general practitioners, and two obstetric consultants or practitioners with special obstetric experience nominated by the authority after consultation with the representative organisations of local practitioners. The duty of the committee would be to scrutinise the list and to make any such recommendations to the authority as are desirable for the purpose of securing and maintaining a high standard of obstetric practice on the part of the practitioners included on the list—e.g., recommendations that a practitioner should be required to undertake a specified period of post-graduate training as a condition of the continued inclusion of his name on the list, or, where required in the public interest, that the name of a practitioner should be removed from the list.

A copy of the list of registered medical practitioners would be supplied to every midwife employed under Section 1 of the Midwives Act, 1936, and she would be instructed that, save in exceptional circumstances, the practitioner to be summoned in an emergency should be one whose name is included in the list. When a midwife is first booked she would request the patient or the responsible representative of the family to select a practitioner from the list to be called in if an emergency arises.

The Central Midwives Board have, with the approval of the Minister, rescinded the rule which requires a midwife, whenever possible, to call in the doctor desired by the patient or, if the patient cannot be

(*Continued at foot of next page*)

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MEDICAL NEWS

University of Cambridge

On June 10th the following degrees were conferred :—

M.D.—J. S. S. Fairley, T. F. Fox, and G. Simon.
M.Chir.—P. H. R. Ghey.
M.B., B.Chir.—*C. G. Jobbins and R. D. Teare.
M.B.—*P. G. Levick, A. Innes, and S. H. Barnett.
* By proxy.

On June 9th Lord Baldwin, chancellor of the university, conferred the hon. degree of D.Sc. on Dr. Francis Peyton Rous of the Rockefeller Institute for Medical Research in New York. In presenting Dr. Rous, the public orator said that he embodied the advance of modern medical research. We lived now free from many of the troubles and sorrows which had afflicted our ancestors, and this was through the researches of those who investigated the cause of disease and especially those at the Rockefeller Institute where "multum laboravit amicus noster non sine spe—quam utinam festinent boni angeli."

Royal College of Surgeons of England

At a meeting of the council of the college held on June 9th, with Sir Cuthbert Wallace, the president, in the chair, it was announced that the subject of the special lecture to be given by Prof. Frank C. Mann, of the University of Minnesota, on Friday, July 15th, at 5 P.M., would be the mechanism of peptic ulceration—a review of the results of experimental investigations.

Diplomas of fellowship were granted to the following candidates :—

L. M. Crooks, M.B. Liverp.; K. K. C. Nambiar, M.B. Madras; J. A. Currie, M.B. Lond., Guy's; R. W. Knowlton, M.D. Camb., Middlesex; G. H. Pearce, M.B. Lond., Univ. Coll.; C. D. P. Jones, M.B. Lond., Univ. Coll.; Harry Ackers, M.B. Liverp.; W. S. McKenzie, M.B. Camb., Middlesex; Harold Goodwin, M.B. Lond., Univ. Coll. and St. Bart.'s; A. G. Leigh, M.D. Liverp., Guy's; H. W. Hall, M.B. Lond., Univ. Coll.; B. J. Sanger, L.R.C.P. Lond., London Hosp.; Alexander Innes, L.R.C.P. Lond., Camb. and St. Bart.'s; P. H. Newman, L.R.C.P. Lond., Middlesex and St. Bart.'s; R. C. F. Catterall, M.B. Camb., Univ. Coll. and London Hosp.; F. R. R. Martin, M.B. Camb., Leeds and Guy's; Joseph Schorstein, L.R.C.P. Lond., Univ. Coll. and Manch.; S. G. Nardell, L.R.C.P. Lond., St. George's and Guy's; J. M. Brown, L.R.C.P. Lond., Guy's; L. B. Joshi, M.B. Bombay, Guy's; A. C. Brewer, M.B. Liverp.; C. D. Donald, M.B. Melb., St. Thomas's; B. K. Rank, M.B. Melb., St. Bart.'s; Robert Cox, M.B. Lond., Guy's and Westminster; J. R. Armstrong, M.B. Belf.; J. A. Bingham, M.B. Belf., Guy's; A. M. Clarke, M.B. Melb., St. Bart.'s; H. L. Davies, M.B. Liverp.; E. H. W. Gifford, M.B. N.Z., Guy's; J. C. Goligher, M.B. Edin., London Hosp.; R. A. Hall, M.B. Leeds, Guy's; J. I. Hayward, M.D. Melb., St. Bart.'s; Jack Heselson, M.B. Cape Town, St. Bart.'s; J. C. Hislop, M.B. Edin., St. Thomas's; M. J. Horgan, M.B. Dubl., St. Bart.'s; G. H. Kitchen, M.D. Toronto, Guy's; Joseph Lannon, M.B. W'tsrand, St. Bart.'s; E. W. McMechan, M.B. Belf., London; Aaron Rakoff, M.B. Dubl., Guy's; S. C. Raw, M.B. Durh.; and M. G. Talwalkar, M.B. Bombay, St. Bart.'s.

A diploma of membership was granted to Sidney Locket of University College, and diplomas in anæsthetics were granted jointly with the Royal College of Physicians to the following candidates :—

H. N. Andrews, J. N. Cave, D. C. Clark, J. F. C. C. Cobley, J. D. Constantin, E. A. Danino, T. D. W. Fryer, J. S. Hawes, B. P. Hill, K. F. Hulbert, V. J. Keating, Barney Lawson, T. J. C. MacDonald, Marguerite R. Marshall, J. G. Mitchell, J. G. Murdoch, H. H. Pinkerton, Frances E. Radcliffe, J. A. W. Robinson, S. G. Shippard, A. M. Simson, H. L. Thornton, O. S. M. Williams, and A. H. R. Yousef.

Mr. Harry Stobie was re-elected a member of the board of examiners in dental surgery, and the following examiners were elected for the ensuing year :—

Dental Surgery.—Surgical Section: Mr. C. P. G. Wakeley, Mr. C. E. Shattock, Mr. E. G. Slesinger, Mr. Reginald Vick, Mr. Basil Hume, and Mr. L. E. C. Norbury. Medical Section: Dr. R. A. Rowlands, Dr. A. H. Douthwaite, and Dr. R. A. Hickling.

Primary Fellowship.—Anatomy: Mr. P. N. B. Odgers, Prof. H. H. Woollard, F.R.S., Prof. R. B. Green, and Mr. E. P. Stibbe. Physiology: Prof. Hamilton Hartridge, F.R.S., Prof. John Mellanby, F.R.S., Prof. D. T. Harris, and Prof. A. St. G. J. Huggett.

Diploma of L.R.C.P., M.R.C.S.—Elementary Biology: Mr. W. A. Cunnington, Mr. A. E. Ellis, Mr. S. R. B. Pask, and Mr. Wilfrid Rushton, D.Sc. Anatomy: Dr. A. J. E. Cave, Prof. W. J. Hamilton, and Prof. A. B. Appleton. Physiology: Prof. Samson Wright and Prof. D. T. Harris. Midwifery: Mr. A. C. Palmer, Mr. Victor Lack, Mr. Trevor Davies, and Mr. Wilfred Shaw. Pathology: Dr. W. G. Barnard, Mr. B. W. Williams, Mr. D. H. Patey, and Prof. W. D. Newcomb.

Diploma in Public Heath.—Part I: Major-General H. M. J. Perry. Part II: Dr. Charles Porter.

Diploma in Tropical Medicine and Hygiene.—Lieut.-General W. P. MacArthur and Dr. Hamilton Fairley.

Diploma in Ophthalmic Medicine and Surgery.—Part I: Mr. Leighton Davies and Mr. Affleck Greeves. Part II: Mr. Adrian Caddy.

Diploma in Psychological Medicine.—Prof. F. L. Golla.

Diploma in Laryngology and Otology.—Part I: Mr. Edward Carew-Shaw and Mr. N. A. Jory. Part II: Mr. T. B. Layton.

Diploma in Medical Radiology.—Part I: Dr. H. T. Flint. Part II: Dr. Hugh Davies.

Diploma in Anæsthetics.—Dr. H. E. Gaskin Boyle.

Diploma in Child Health.—Dr. A. G. Maitland-Jones.

The posts of first house surgeon (R.S.O.) and second house surgeon at the Smithdown-road Hospital, Liverpool, were recognised for the six months' surgical practice required of candidates for the final fellowship examination.

Dr. John Beattie, director of research at the college, will deliver three Arris and Gale lectures on recent work in experimental surgery, on June 24th, 27th, and 29th. The lectures will take place at the college, Lincoln's Inn-fields, London, W.C., at 5 P.M., and will be open to medical practitioners and advanced students.

University of Sheffield

Prof. Irvine Masson has been elected to the office of vice-chancellor, which is about to become vacant owing to the retirement of Dr. A. W. Pickard-Cambridge. Prof. Masson holds the chair of chemistry and is head of the department of pure science in the University of Durham.

Prof. G. A. Clark has been elected representative of the University on the General Medical Council.

University of Edinburgh

Dr. L. S. P. Davidson, regius professor of medicine in the University of Aberdeen, has been appointed to the chair of medicine in the University in succession to Prof. W. T. Ritchie, who is retiring.

Dr. Davidson, who is 44, was educated at Cheltenham College and at Trinity College, Cambridge, and served with the Gordon Highlanders for three years during the war, reaching the rank of captain. He was severely wounded and returned to his medical studies at Edinburgh in 1917, graduating with first-class honours two years later. He gained the gold medal for his M.D. thesis in 1925. On graduation he held resident appointments at the Royal Infirmary and the Leith General Hospital. He was appointed assistant to the professor of bacteriology at Edinburgh and continued to work in that department under the Medical Research Council till his appointment to his present chair in 1930. Meanwhile in 1927 he had been appointed assistant physician to the Royal Infirmary and the following year had become lecturer in systematic and clinical medicine in the University. He is F.R.C.P.E. and F.R.S.E., and in 1936 he became M.R.C.P. Lond. His earlier papers were largely bacteriological, but of late years he has been primarily concerned with the study of nutritional disorders and especially the anæmias. He has also worked on Weil's disease.

Deutsche Röntgen-Gesellschaft

The annual congress of this society will be held in Munich from July 4th to 7th. Further information may be had from Prof. Frik, Brückenalle 22, Berlin, NW 87.

British Postgraduate Medical School

Six lectures on acute infectious fevers are to be given on Tuesdays at 4.30 P.M. Dr. Andrew Topping will give the first on June 21st, when he will speak on the diagnosis and disposal of fever cases from the general practitioner's standpoint. Other lecturers will be Dr. J. S. Anderson, Dr. William Gunn, Dr. Maurice Mitman, and Dr. Robert Cruickshank. On July 1st and 8th, at 2.30 P.M., Mr. E. Rock Carling is lecturing on surgery of the spleen. Further information may be had from the dean of the school, Ducane-road, London, W.12.

(*Continued from previous page*)

consulted, by the responsible representative of the family. This will facilitate the procedure suggested above, but it will be understood, of course, that in the exceptional case in which no doctor on the list is acceptable to the expectant mother, the midwife should call in the doctor of the patient's choice.

The Minister asks local authorities to consider the above suggestions and inform him as soon as possible of the action they propose to take.

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British Institute of Philosophy

The second Wright memorial lecture will be given by Prof. W. G. S. Adams on Tuesday, June 28th, at 5.45 P.M., at University College, Gower-street, London, W.C. He will speak on the philosophical study of politics. Cards of admission may be obtained from the director of studies at University Hall, 14, Gordon-square, London, W.C.1.

St. Mary's Hospital, Paddington

In addition to the lectures already announced in the course on pathological research in its relation to medicine which is being given at this hospital, on Tuesday, June 21st, at 5 P.M., Prof. Gustav Singer of Vienna will speak on the fight against diabetes. The lecture will be open to all members of the medical profession without fee.

Rheumatism Research Fellowship

The Empire Rheumatism Council are about to appoint a research fellow to carry out a task of research into the bacteriology and epidemiology of acute rheumatism. Special experience of acute rheumatism and in the bacteriology of the hæmolytic streptococci will be a valuable qualification and the fellowship will carry a salary of £750 a year. Further information will be found in our advertisement columns.

Harveian Society of London

Sir Alfred Webb-Johnson, the president, took the chair at the annual Buckston Browne banquet of this society, held on June 14th at the Merchant Taylor's Hall. Major the Hon. J. J. Astor, proposing the health of the society, said that Harvey's method had been based on boundless curiosity and the ceaseless collection of facts, from which he drew sure conclusions. The society followed the same method of observation and deduction. Harvey had a healthy scepticism, which his times had fostered. The president, in reply, recalled that Harvey had taught medical men to search out the secrets of Nature by way of experiment: "Di laboribus omnia vendunt." He had given his patrimony to provide an annual feast at the Royal College of Physicians, to perpetuate the spirit of concord and social friendship among his brethren. This ideal of Harvey's had been ensured in this society by the generosity of Sir Buckston Browne, who had endowed the annual banquet. Harvey had not had to contend with the patent medicines and appliances which were so prominently advertised by the Government in the books of stamps sold by the Post Office. He would have insisted on a Government subsidy to voluntary hospitals. The society gave a prize every year for an essay on a selected subject, also endowed by Sir Buckston Browne, and had the money to rehang the bells in the church of Hempstead, in Essex. When the Royal College of Physicians rebuilt the tower, the society would play their part.

Dr. John Taylor, proposing the health of the visitors, spoke of Major Astor's service to the M.C.C. as its president and to the *Times* as its chief proprietor. The names of the distinguished guests would almost make up a volume of the Dictionary of National Biography. Captain H. F. C. Crookshank, M.P., in reply, maintained that politicians were not a self-advertising race. They were, unlike medical men, simple plain men who dealt with the obvious. They had not the joys of a post-mortem, for if they made a mistake they were electorally dead. The Rev. Patrick McCormick, also in reply, testified that he had not suffered of any physicians but had been much helped all his life by medical men. Sir Travers Humphreys remarked that both Cabinet Ministers and the cloth were not above making promises for the future. He could hardly promise members of the society that if they would bring an action he would give judgment in their favour, but he would promise that no medical witness in his court would be kept waiting one minute longer than was absolutely necessary. This was not because, as one of his brethren had suggested, he did not believe a word the medical witnesses said and desired to get rid of them as quickly as possible, but because he realised that they had far more important work to do outside court than they could ever have inside it.

Public Schools Exploring Society

An honorary surgeon is required by this society for their Newfoundland expedition which leaves on July 29th and returns on Sept. 12th. Further particulars may be had from the hon. leader, White Barn, Old Oxted, Surrey.

International Hospital Association

A meeting of the council of management of this association was held recently in Frankfort-on-Maine, when representatives of Canada, Czechoslovakia, Belgium, Eire, Germany, Great Britain, Holland, Hungary, Italy, Switzerland, and the United States of America met under the presidency of Dr. René Sand. Dr. von Deschwanden was elected hon. president, Dr. W. Alter, hon. secretary, Miss R. M. Murray, executive secretary, and Mr. E. Heisch, hon. treasurer. Dr. Malcolm T. MacEachern, associate director of the American College of Surgeons, Chicago, was elected president and will preside at the congress of the association to be held in Toronto from Sept. 19th–23rd, 1939. The congress in 1941 is planned to take place in Berlin, under the presidency of Dr. R. Zeitler, and an invitation brought by Mr. W. McAdam Eccles from the United Kingdom council of the association to hold the congress of 1943 in Great Britain was accepted. The joint hon. secretaries of the association may be addressed at 12, Grosvenor-crescent, London, S.W.1.

Medical Diary

June 20th to June 26th

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
TUESDAY.—5.30 P.M., general meeting of fellows.

ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY.
WEDNESDAY, 5 P.M. (1, Wimpole-street, W.), Prof. Charles Flandin: Recent Advances in Leprosy and the Methods Adopted for Dealing with the Problem in France. (Prosser White oration.)

BRITISH PSYCHOLOGICAL SOCIETY.
Medical Section.
WEDNESDAY.—8.30 P.M. (B.M.A. House, Tavistock-square, W.C.), Dr. Karin Stephen: Danger Situations Underlying Anxiety.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn-fields, W.C.
FRIDAY.—5 P.M., Dr. John Beattie: Recent Work in Experimental Surgery. (First of three Arris and Gale lectures.)

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane-road, W.
MONDAY.—4.30 P.M., Dr. Sharpey-Schafer: Diseases of the Ductless Glands.
TUESDAY.—4.30 P.M., Dr. Andrew Topping: The Diagnosis and Disposal of Fever Cases from the General Practitioner's Standpoint.
WEDNESDAY.—Noon, clinical and pathological conference (medical). 2 P.M., Prof. J. H. Dible: The Pathological Changes in the Body produced by Certain Poisons. 3 P.M., clinical and pathological conference (surgical). 4.30 P.M., Prof. J. C. Drummond, D.Sc.: Practical Aspects of Modern Vitamin Research.
THURSDAY.—2.15 P.M., Dr. Duncan White: radiological demonstration.
FRIDAY.—2 P.M., clinical and pathological conference (obstetrics and gynæcology).
Daily, 10 A.M. to 4 P.M., medical clinics, surgical clinics and operations, obstetrical and gynæcological clinics and operations.

ST. MARY'S HOSPITAL, W.
TUESDAY.—5 P.M. (Institute of Pathology and Research), Prof. Gustav Singer (Vienna): Fight against Diabetes.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY.—2 P.M., Dr. R. S. Frew: Mental Deficiency. 3 P.M., Dr. D. N. Nabarro: Congenital Syphilis.
Out-patient clinics daily at 10 A.M. and ward visits at 2 P.M.

ST. GEORGE'S HOSPITAL, S.W.
MONDAY.—5 P.M., Sir Frederick Hobday: Comparative Medicine.
THURSDAY.—5 P.M., Dr. Anthony Feiling: neurological demonstration.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY to SUNDAY.—ST. PETER'S HOSPITAL, Henrietta-street, W.C., all-day course in urology.—WEST END HOSPITAL FOR NERVOUS DISEASES, Welbeck-street, W., afternoon course in neurology.—PRINCESS ELIZABETH OF YORK HOSPITAL, Shadwell, E., Sat. and Sun. course in children's diseases.—PRESTON HALL, near Maidstone, Kent, Sat., demonstration on pulmonary tuberculosis.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION.
WEDNESDAY.—3 P.M., visit to the Grand Priory, St. John's-gate, Clerkenwell.

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PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS

Reassembly after Whitsuntide

BOTH Houses of Parliament reassembled on June 14th after the Whitsuntide recess.

In the House of Lords on June 14th the Children and Young Persons Bill was read a second time. The amendments made to the Food and Drugs Bill by the Joint Committee were considered in committee and agreed to.—The Street Playgrounds Bill was agreed to on Report.—The Housing (Rural Workers) Amendment Bill and the Prevention and Treatment of Blindness (Scotland) Bill passed through Committee.

QUESTION TIME

TUESDAY, JUNE 14TH

Silicosis Research

Mr. JAMES GRIFFITHS asked the Chancellor of the Duchy of Lancaster, as representing the Lord President of the Council, what further steps it was proposed to take in the investigation into the problem of silicosis and other lung diseases in the anthracite coal-field of South Wales.—Earl WINTERTON replied: As soon as the examination of the data and material recently collected at Ammanford has been completed, the Medical Research Council propose to extend the investigation to at least one further colliery. Thereafter a report on the whole of the findings will be prepared.

Mustard-gas Experiments

Mr. GEORGE GRIFFITHS asked the Home Secretary whether, in view of the statement in the air-raid precautions handbook No. 3 that all persons not previously exposed were about equally sensitive to mustard-gas, he would give details of the experiments by which the conclusions of Prof. Marshall and others, published in the *Journal of Pharmacology and Experimental Therapeutics* for 1929, that some people were 600 times as sensitive as others, were refuted.—Mr. GEOFFREY LLOYD, Under-Secretary, Home Office, replied: The hon. Member, I gather, is referring to a report published in 1919. The experiments described in that report were carried out with comparatively high concentrations of gas, whereas the statement in the handbook reflects recent similar experiments with lower concentrations, and the difference in experience is probably due to that difference in concentration.

Tropical Diseases

Mr. DAVID ADAMS asked the Chancellor of the Duchy of Lancaster, as representing the Lord President of the Council, whether, in view of the fact that the report of the Medical Research Council, 1936–37, quoted estimates to the effect that the direct financial loss due to malaria in India alone amounted to between £23,000,000 and £50,000,000 per annum, the indirect losses being still greater, and of the extreme importance of these losses, he would institute inquiries with a view to supplying reliable information on this matter with reference to all important tropical diseases.—Earl WINTERTON replied: The Lord President is advised that it would be extremely difficult to obtain figures of any real value for the economic loss due to different diseases in tropical territories. Estimates such as those quoted by the Medical Research Council are of necessity very rough and based on incomplete data. They are useful only as illustrating in a general way the magnitude of the problem. It would certainly be true to say that the losses due to diseases other than malaria are also enormous.

Dietary Surveys

Mr. HENDERSON STEWART asked the Secretary of State for Scotland what surveys had been set afoot with regard to the dietary habits of the people and their nutritional consequences; whether any reports had yet been received, and when it was anticipated that the full results of the inquiries would be available.—Mr. COLVILLE replied: The Advisory Committee on Nutrition are carrying out extensive dietary surveys in England and Scotland. In Scotland the work is in the hands of Prof. Cathcart and Sir John Orr and it is expected that the studies will be completed in the course of the summer. Sir John Orr is also undertaking on behalf of the Carnegie United Kingdom Trust a scheme of research to determine the relationship between the diets and the state of development and health of children and adolescents. This research includes a dietary survey carried out by a team of trained investigators. The experiments cover a period of twelve months and it is not expected that any results can be published until 1939.

Hospital Finances

Mr. DAVID ADAMS asked the Minister of Health whether he was aware of a growing body of opinion to the effect that British hospital finance was in need of fundamental overhauling; and whether he would consider the possibility of instituting a corporation on the lines of the British Broadcasting Corporation, including representatives of the central government, of local authorities, of voluntary hospitals, and of the medical profession, to be put in complete charge of all hospital finances.—Mr. ELLIOT replied: I am aware that opinions have been expressed on the lines indicated in the first part of the question; but I could not commit myself to the view that the action proposed by the hon. Member would provide an appropriate solution.

Births, Marriages, and Deaths

BIRTHS

CAREY.—On June 9th, at North Audley-street, W., the wife of Dr. G. F. Carey—a daughter.
EASTON.—On June 12th, the wife of Dr. Alan M. Easton, of Great Bookham, Surrey—a daughter.
FURLONG.—On June 6th, the wife of Mr. Ronald Furlong, F.R.C.S.—a daughter.
GLYNN.—On June 7th, at Blundellsands, the wife of Dr. Eric Glynn—a son.
HUNTER.—On June 9th, the wife of Dr. Donald Hunter—a son.
KINGSLEY.—On June 9th, at Burton Latimer, Northants, the wife of Dr. A. P. Kingsley—a son.
MIDDLETON.—On June 13th, at Aberdeen, the wife of Dr. G. P. Middleton, Ballater—a daughter.
SKINNER.—On June 10th, at Oxford, the wife of Dr. Ian Skinner—a daughter.
WALLACE.—On June 8th, at Welbeck-street, W., the wife of Dr. H. J. Wallace—a son.
WILLIAMS.—On June 8th, 1938, at Aspland-road Maternity Home, Norwich, to Joy (née Jewson), wife of Denis Williams, M.D., M.R.C.P.—a son.

MARRIAGES

ERWIN—GORST.—On June 9th, in London, Grahame Stoddart Erwin, M.B. N.Z., to Joan Ravenscroft Gorst.
HEMPHILL—LOIR DE MONTÈS.—On June 13th, at the Church of the British Embassy, Paris, Robert Edward Hemphill, M.B., D.P.M., to Marie Louise, youngest daughter of Dr. and Mme. Adrien Loir de Montès, of Paris.
MACDONALD—SMITH.—On June 8th, at St. Margaret's, Westminster, William T. Macdonald, M.B. Edin., to Kathleen Olive Smith.
MURRAY—COOPER.—On June 9th, at Chelsea Old Church, David Robinson Murray, M.B. Belf., to Hilda Margaret Cooper.
RUGG-GUNN—GRESHAM-WELLS.—On June 11th, in London, Andrew Rugg-Gunn, M.B. Edin., F.R.C.S., to Cecilia Mary Gresham-Wells.
WALKER—JOHNSON.—On June 11th, at Burnham Church, Bucks, Desmond Greer Walker, M.B. Dubl., to Geraldine Elizabeth Johnson.

DEATHS

ANCRUM.—On June 9th, at Gloucester, George Wayland Ancrum, M.D. Edin., aged 74.
BAILDON.—On June 13th, Francis Joseph Baildon, M.B. Edin., of Southport.
BLUETT.—On June 8th, at Bath, George Mallack Bluett, M.R.C.S. Eng., L.S.A., aged 77.
DOBSON.—On June 12th, at Bournemouth, Leonard Charles Talbot Dobson, M.D. Lond.
O'HEFFERNAN.—On June 13th, at Croydon, William Hilton O'Heffernan, M.R.C.S., late Captain R.A.M.C., in his 75th year.
SOADY.—On June 8th, at Crediton, William Henry Soady, L.R.C.P.I., aged 54.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

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Appointments

ALLAN, F. G., M.B. Lond., F.R.C.S. Eng., Hon. Assistant Orthopædic Surgeon to the Children's Hospital, Birmingham.

GIBB, ANN F., M.B. Edin., Assistant Resident Medical Officer at the South Middlesex Fever Hospital, Isleworth.

NICHOL, R. W., B.Chir. Camb., M.C.O.G., Obstetric Registrar at the Royal Northern Hospital, London.

London County Council Hospital Staff.—The following appointments are announced. A.M.O. (I) or (II) = Assistant Medical Officer, Grade I or II:—

AHERN, R. T., M.B. N.U.I., D.P.H., A.M.O. (I), St. Luke's, Lowestoft;
HUNTER, MATTHEW, M.B. Edin., A.M.O. (II), King George V Sanatorium;
NICOL, ANNA I., M.B. Edin., A.M.O. (II), Norwood Hospital for Children;
SHARKEY, JOSEPH, M.B. N.U.I., A.M.O. (II), St. Alfege's;
ROTHSCHILD, P. L. E., L.R.C.P. Edin., M.D., Clinical Assistant, Fulham;
CHITTY, PENUEL M., M.B. Aberd., Clinical Assistant, St. Charles';
MACKENZIE, EDNA F., M.B. Sydney, M.R.C.P. Lond., Clinical Assistant, St. Charles'; and
JERRAM, C. W. S., M.B. N.Z., Clinical Assistant, St. Mary, Islington.
LAYTON, T. B., M.S. Lond., F.R.C.S. Eng., Part-time Ear, Nose, and Throat Specialist on the Consultant and Specialist Staff.

Queen Mary's Hospital for the East End.—The following appointments are announced:—

O'SULLIVAN, J. V., M.D. N.U.I., F.R.C.S. Eng., M.R.C.P. Lond., M.C.O.G., Assistant Hon. Obstetric Surgeon;
SMALL, H. A., M.B. N.Z., F.R.C.S. Eng., Assistant Surgeon; and
SELLORS, T. HOLMES, D.M., M.Ch. Oxon., F.R.C.S. Eng., Surgeon.

Charterhouse Rheumatism Clinic, London.—The following have been appointed Hon. Clinical Assistants:—

ANDREW, DOUGLAS, M.B. Brist.;
CYRIAX, JAMES, M.B. Camb.;
GREENE, RAYMOND, D.M. Oxon.; and
SETH-SMITH, D. W., M.R.C.S. Eng.

Certifying Surgeons under the Factory and Workshop Acts: Dr. E. H. W. DUNCAN (Banff District, Banff); Dr. W. A. G. BELL, (Finedon District, Northampton); Dr. A. M. KERR (Llandrindod Wells District, Radnor); Dr. ISAAC HESFORD (Kirkby Stephen District, Westmorland); Dr. A. C. HOLMS (Billingborough District, Lincoln); Dr. H. V. THWAITES (West Calder District, Midlothian).

Vacancies

For further information refer to the advertisement columns

Aberdare Urban District Council Education Committee.—Asst. School M.O., &c., £600.
Aberdeen Royal Mental Hosp.—Asst. Phys., £400.
Army Dental Corps.—Dental Surgeons.
Ashton-under-Lyne District Infirmary.—Res. Surg. O., Cas. H.S., and H.S., at rate of £200, £180, and £150 respectively.
Battersea General Hosp., S.W.—H.P. and H.S., each £130.
Birmingham, City Mental Hosp.—Med. Supt., Winson Green Division, £1100.
Birmingham, Dudley-road Hosp.—Physician, £650.
Birmingham and Midland Eye Hosp.—H.S., at rate of £130.
Bolton Royal Infirmary.—H.S., £150.
Bradford Children's Hosp.—H.S., £150.
Bradford Royal Infirmary.—Res. Surg. O., £250. Also Asst. Radium Officer, £175.
Brighton Royal Sussex County Hosp.—Cas. H.S., £120.
Bristol Royal Infirmary, &c.—Hon. Asst. Surgeon to Joint Fracture Dept.
Burton-on-Trent General Infirmary.—Cas. O. and H.P., £150.
Buxton, Derbyshire, Devonshire Royal Hosp.—H.P., at rate of £150.
Canterbury, Kent and Canterbury Hosp.—H.S. to Spec. Depts., at rate of £125.
Central London Throat, Nose, and Ear Hosp., Gray's Inn-road, W.C.—Hon. Assts. in Out-patient Dept.
Chichester, Royal West Sussex Hosp.—Sen. and Jun. H.S.'s, £175 and £125 respectively.
Coventry City.—Asst. School M.O., &c., £500.
Coventry and Warwickshire Hosp.—H.S., at rate of £150. Also Cas. O., at rate of £150–£250.
Derbyshire County Council.—Asst. County M.O.H., £700.
Dewsbury and District General Infirmary.—Sen. H.S. and Second H.S., £200 and £150 respectively.
Doncaster Royal Infirmary.—Cas. H.S., at rate of £150.
Dover, Royal Victoria Hosp.—H.P., at rate of £120.
Dreadnought Hosp., Greenwich.—Receiving Room Officer, at rate of £150.
Durham County Hosp.—H.S., at rate of £150.
Durham County and Sunderland Eye Infirmary.—H.S., £350.
Ealing Borough.—Asst. M.O., £450.
Elizabeth Garrett Anderson Hosp., Euston-road, N.W.—H.P., H.S.'s, and Obstet. Asst., each at rate of £50.
Empire Rheumatism Council.—Research Fellow, £750.
Essex County Council, Oldchurch County Hosp., Romford.—Jun., Res. M.O., £250.
Exeter, Royal Devon and Exeter Hosp.—Res. Surg. O., £250.
Gloucestershire Royal Infirmary.—Two H.P.'s and two H.S.'s each at rate of £150.
Grimsby and District Hosp.—Res. Surg. O., at rate of £225.
Hampstead General Hosp., Haverstock Hill, N.W.—H.S., at rate of £100. Also Surg. to Out-patients.
Hastings, Royal East Sussex Hosp.—Sen. H.S., at rate of £200.
Herefordshire General Hosp.—H.P., £100.
Hertford County Hosp.—H.S., at rate of £200.
Holland (Lincolnshire) County Council.—Asst. M.O.H., £600.
Hornsey Central Hosp., Crouch End, N.—Hon. Radiologist, £250.
Hosp. for Consumption and Diseases of the Chest, Brompton, S.W.—Med. Reg., £150.
Hosp. for Tropical Diseases, Gordon-street, W.C.—H.P., at rate of £120.
Hosp. of St. John and St. Elizabeth, 60, Grove End-road, N.W.—Res. H.P., at rate of £100.
Huddersfield Royal Infirmary.—H.S., at rate of £150.
Hull Royal Infirmary.—Second Cas. O., at rate of £150.
Ilford, King George Hosp.—Med. Reg., £150. Also H.S., at rate of £100.
Indian Medical Service.—Commissions.
Ipswich, East Suffolk and Ipswich Hosp.—H.S. to Orthopædic and Fracture Dept., £144.
Isleworth, West Middlesex County Hosp.—Res. Asst. M.O. (Surgical), £400.
Jewish Maternity Hosp., Underwood-street, E.—Res. M.O., at rate of £75.
Khartoum, Stack Medical Research Laboratories.—Jun. Lab. Asst., £E.324.
Kidderminster and District General Hosp.—Jun. H.S., £100.
Lancaster County Mental Hosp.—Asst. M.O., £550.
Leamington Spa, Warneford General Hosp.—Sen. Res. Surg. O., £200.
Leeds Public Dispensary and Hosp.—Hon. Surgeon.
Liverpool City.—Asst. Venereal Diseases M.O., £400.
London Hosp., E.—Anæsthetist to Dental Dept., £25.
Maidstone, Kent County Ophthalmic and Aural Hosp.—Ophth. H.S., at rate of £200.
Manchester, County Mental Hosp., Prestwich.—Deputy Med. Supt., £750.
Manchester Royal Infirmary.—Jun. Asst. M.O. in Radiological Dept., at rate of £350. Also Asst. M.O. to Dermatological Dept., £35.
Metropolitan Police, New Scotland Yard, S.W.—Sen. Dental Surgeon, £700.
Middlesbrough County Borough.—Asst. M.O.H., &c., £350.
Middlesex County Council.—Asst. M.O. in P.H. and School Med. Dept., £600.
National Temperance Hosp., Hampstead-road, N.W.—H.P., at rate of £100.
Newcastle General Hosp.—Med. Reg. and Surg. Reg., each £250. Also two H.S.'s and H.P., each at rate of £150.
Newcastle-upon-Tyne City and County.—Sen. Child Welfare Officer, £750.
North Middlesex County Hosp., Silver-street, N.—Locum Tenans Pathologist, 1 guinea per day resident, 9 guineas per week non-resident.
Norwood and District Cottage Hosp.—Hon. Anæsthetist.
Nottingham General Hosp.—Res. Cas. O. and H.S., each at rate of £150.
Nottingham Isolation Hosp., Hucknall-road.—Res. M.O., at rate of £250.
Oxford, Wingfield-Morris Orthopædic Hosp.—Res. H.S., at rate of £100–£120.
Pembroke County War Memorial Hosp., Haverfordwest.—Res. H.S., £200.
Plymouth, Mount Gold Orthopædic and Pulmonary Tuberculosis Hosp.—Res. M.O., £300.
Princess Elizabeth of York Hosp. for Children, Shadwell, E.—Asst. Surgeon.
Princess Louise Kensington Hosp. for Children, N. Kensington, W.—Hon. Asst. Phys., &c.
Queen Mary's Hosp. for the East End, Stratford, E.—Cas. and Out-patient Officer, at rate of £150.
Rhondda Urban District Council.—Asst M.O., £500.
Rotherham Hosp.—Cas. H.S., £150.
Royal Chest Hosp., City-road, E.C.—H.P., at rate of £100.
Royal Free Hosp., &c., W.C.—Res. Asst. Pathologist in Pathology Unit, at rate of £150.
Royal Naval Medical Service.—M.O.'s.
Royal Northern Hosp., Holloway, N.—Ophth. Reg., £50.
St. Helens Hosp., Lancs.—Sen. H.S., £225.
St. John's Hosp., Lewisham, S.E.—H.S., at rate of £100.
St. Mary's Hosp., W.—Cas. H.S., at rate of £100.
Salford Royal Hosp.—H.S., at rate of £125.
Sheffield Royal Infirmary.—Clin. Asst. to Ophthalmic Dept., £300.
Shoreham-by-Sea, Southlands Hosp.—Asst Res. M.O., £300.
Shrewsbury, Royal Salop Infirmary.—Two H.S.'s, each at rate of £160.
Southampton, Royal South Hants and Southampton Hosp.—Res. Anæsthetist and Cas. O., each at rate of £150.
Staffordshire General Infirmary.—Second H.S., £175.
Stoke-on-Trent, Longton Hosp.—H.S., £180–£200.
Sunderland Royal Infirmary.—H.S., at rate of £120.
Wakefield, Clayton Hosp., &c.—Radiologist, £700.
Walsall General Hosp.—H.S., at rate of £150.
Warneford Hosp., Oxford.—Physician Supt., £1000.
Wolverhampton Education Committee.—Sen. Asst. School M.O., £700.
Wolverhampton Royal Hosp.—Res. Anæsthetist, at rate of £200. Also H.S. and H.P., each at rate of £100.
Worcester Royal Infirmary.—H.S., £120. H.P., £150. Also Res. Anæsthetist, £140.
York County Hosp.—Res. Anæsthetist and Second H.S., £150.

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NOTES, COMMENTS, AND ABSTRACTS

POLITICS AS A BIOLOGICAL PROBLEM

Mr. Roberts is a veteran among amateur sociologists whose work must always command attention. The purpose of his most recent book [1] is to try to instruct politicians and public men generally in such principles of biological science as provide some guide to the complexities of modern political life. Even the writings of such masters of sociology as Herbert Spencer and William McDougall can hardly be said to provide practical statesmen with a programme or with driving power, and we doubt whether Mr. Roberts's lessons will solve many of their more pressing problems. He has always been a realist, almost a pessimist in political outlook. For him it is the subhuman, instinctive forces which govern society. Man is at best only a pseudo-rational creature and is dominated by vague biological tendencies much more than by his own intellect or by the pursuit of the ideal. Mr. Roberts bases his thesis largely on an elaborate and ingenious analogy of human society to the physiological organisation of the lower organisms. In this effort to minimise the importance of intellect in human affairs he perhaps reckons without his host. Even without giving way to undue idealism or optimism the enzymic nature of intelligence cannot be overlooked. It might even be maintained that the ills which beset human societies are more the result of aberrations of intelligence than a consummation of the brute instinct. That the brain is an uncertain and disappointing organ in adjusting man to his environment is only too obvious, but we may well believe that in the end it will do its job and have its say. A man may batter his head against a stone wall once, or twice, or several times, but in the end he generally desists before he has battered himself to pieces. Mr. Roberts lacks cohesion as an exponent of philosophical thought. His ideas are formlessly thrown together, his analogies are occasionally treacherous, and his verbiage often confusing. From time to time, however, he writes with vigour and clarity. This book is certainly suggestive and well worth reading by anyone interested in the deeper issues of modern social life.

A STETHOSCOPE WITH A VALVE AMPLIFIER

A STETHOSCOPE with valve amplifier for use in auscultation of the heart has recently been produced by the Western Electric Company, Ltd. (Bush House, Aldwych, London, W.C.2). It is recommended for use by doctors who suffer from some degree of deafness or alternatively by those of normal hearing who wish to detect cardiac murmurs below the limits of normal audibility. The instrument is contained in a neat black case 12½ in. by 9 in. by 4½ in. It has a moderately heavy metal chest piece which is held against the patient's chest, while the receiver resembling an ear-phone but fitted with a clip which holds it in the physician's waistcoat pocket, is connected by a rubber tube to his binaural stethoscope. The physician thus hears through his own stethoscope the heart sounds magnified by passage through the instrument. The degree of magnification can be altered by a volume control and a filter is provided whereby, by turning a knob, the heart sounds themselves can be reduced in intensity and the murmurs relatively accentuated.

We have tested the instrument and find that it certainly increases the intensity of the heart sounds. The alteration in quality, although this has been reduced to a minimum, is still great enough to make the sounds seem strange and unfamiliar to the observer with normal hearing. Unless he is willing to discard the ordinary binaural stethoscope and use only this instrument he is unlikely to gain much help from it; but a physician who is hard of hearing and therefore willing to accustom himself exclusively to the new instrument might well find that it restores confidence in his power to interpret heart sounds and murmurs.

STUDIES OF NATIVE RACES

SOME curious procreative beliefs are current among Australian aborigines according to Dr. Ashley-Montagu.[1] He says that the relationship of parents to children is regarded purely as a social one, and that this failure to recognise any blood-tie between either mother or father and child has been insufficiently appreciated even by students of Australian ethnology. Among the aborigines the mother is looked upon merely as a vehicle through which the spirit-child, the incarnation of some ancestral being, must pass to enter the world. A child, they hold, must be born into a family; hence the necessity for a father. Should a child be born out of wedlock—that is, outside the family—the event is regarded as the work of some malign influence, either human or superhuman.

Dr. Laubscher has studied the South African Cape Bantu and in particular the Temba tribe on a broader basis. He is concerned with their folklore, customs, initiation and burial rites, and sexual beliefs, and includes in his book [2] an interesting study of their psychopathology.

CHILDBIRTH AS A PHYSIOLOGICAL PROCESS

Mr. Ludovici, who is a man with a theory and a good literary style,[3] inveighs against what he calls the hoax perpetuated by women and doctors that childbearing is a dangerous and painful proceeding, whereas in fact it should be regarded not only as painless but even as pleasurable. In the second part he discusses the conditions which he thinks militate against this, such as the relative senility of primigravidæ, feminine athleticism, miscegenation, faulty nutrition, faulty posture, and a host of other more or less controversial factors. Widely read and adept though he is at selecting and manipulating facts for his own ends, his book is irritating in that it is at times contradictious and contains many ill-drawn conclusions. Thus while he condemns athleticism in women because it tends to increase the rigidity of the pelvic girdle, he finds no fault with their living a life demanding hard physical work and endurance such as that of the Highlanders; and though he accuses doctors of looking upon childbirth as a pathological process he quotes Eden and Holland and many other medical authorities to the contrary. Those with obstetrical experience will feel that he insists unduly on the normality of the lateral recumbent posture during parturition and his analogy with the quadrupeds is not a good one. We might with equal justification say that we have yet to see our fellow biped, the hen, reclining on her side during the act of egg-laying. When he deplores the relative senility of primigravidæ he is on surer ground and with considerable justification blames civilisation and feminism as being at the root of this evil, but he offers no very practical remedy—and moreover have not these things their pros as well as their cons? If the girl of 16 is physiologically mature enough for childbearing is she also mature enough to become a good wife and mother? Who is to marry, or at any rate impregnate, her? Not it seems the youth of 16, for whom Mr. Ludovici has no plans. Nor incidentally does he seem to care that half the world-population should remain more or less illiterate. His ideas as to what

[1] Biopolitics. An essay in the physiology, pathology, and politics of the social and somatic organism. By Morley Roberts. London: J. M. Dent and Sons. 1938. Pp. 240. 15s.

[1] Coming into Being among the Australian Aborigines. By M. F. Ashley-Montagu, Ph.D., assistant professor of anatomy, New York University. London: George Routledge and Sons. 1937. Pp. 362. 21s.

[2] Sex, Custom and Psychopathology. By B. J. F. Laubscher, senior psychiatrist, Union Mental Service. Same publishers. 1937. Pp. 347. 21s.

[3] The Truth about Childbirth. By Anthony M. Ludovici. London: Kegan Paul, Trench, Trübner and Co. 1937. Pp. 294. 10s. 6d.

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constitutes frustration in the male and female are somewhat theoretical, and the statement that athletic women are more prone to dysmenorrhœa than sedentary ones is not well supported by facts. Perhaps the author does not know that the G.P.O. with its vast sedentary female staff has been described as the home of dysmenorrhœa. Again he repeatedly infers that the maternal death-rate is necessarily higher in women of the unskilled working class, whereas this is not borne out by figures. His attempt to prove that adolescence is an advantageous time for childbearing would be more convincing if he quoted more figures relating purely to primigravidæ at various ages. Mr. Ludovici is perhaps unjust to the profession in that he implies that only a few enlightened doctors think clearly about the problems of maternity, or, shall we say, think as he would have them think. He forgets that the profession has to face these problems as they are and not as it would like them to be.

VERNON-SPENCER HEARING-AIDS

PANAUDION LTD. (120, Wigmore-street, London, W.1) have submitted to us their Vernon-Spencer three-valve hearing-aid, model V.S.2. In this the high-tension battery is housed in a case 5½ in. long which weighs 10 oz., while the valves and low-tension accumulator are contained in a similar case weighing 18 oz., and the microphone is separate. Thus the model is designed to be carried in the pockets or under the clothing. Piezo-electric crystals are employed for the microphone and for the earphone; these are produced in the United Kingdom and are said to be superior to imported crystals. For the low tension, a 2-volt accumulator is used, as being preferable to a dry battery; two of these are supplied together with a trickle charger, and are of special design, containing neither free acid nor jelly acid. The high tension is supplied by a 45-volt Ever-Ready battery obtainable anywhere. The advantage of this "two-unit" design is that the instrument can be worn upon the person, and this without great inconvenience. The instrument is very well finished, and the cases are covered in real morocco leather. Another model, V.S.1, is similar in all respects except that it is contained in one case weighing 28 oz.; both are priced at 20 guineas. It is claimed that these instruments, which are provided with an entirely new type of midget valve, have a substantially even response up to 8000 cycles, whatever volume is employed, and the advantage of a crystal microphone in giving a quiet background is well known. A Junior model, with two valves and a carbon microphone, is priced at 12 guineas, and there is also an all-mains instrument, listed at 50 guineas, which is intended especially for use at board meetings and conferences. A free trial is always allowed before purchase.

THE COMPASS CAMERA

IN the last twelve years miniature photography has made large strides, chiefly because its problems are identical with those that the cinema industry has had to overcome. Its success depends first on the production of films of sufficiently fine grain to allow of great enlargement, secondly on the manufacture of lenses with much increased resolving power giving sharper negatives, and finally on improvements in the design and construction of the cameras themselves. To the inherent advantage of the miniature camera—its portability—have been added a new precision, a greater range of possible subjects, and economy in materials. If their full scope is to be utilised, however, many miniature cameras require a number of loose accessories, which add to their bulk and complexity. It is claimed for the Compass Camera that it has overcome this objection. It is a metal instrument about 2½ in. square by 1¼ in. thick, weighing about half a pound. It takes negatives 1½ in. by 1 in. either on separate films or plates which are loaded in daylight in light-tight envelopes, or on roll-films. Everything necessary for good results is built into the camera, including an exposure meter, a range-finder and focusing screen, a depth-of-focus scale, three alternative light filters, and a shutter giving exposures from 1/500 to 4½ sec. For easy subjects only the simplest adjustments need be made, but results can be obtained in difficult conditions that compare favourably with those of bulky instruments, and it is suggested that the camera may be useful for clinical photography. It was designed by Mr. N. Pemberton-Billing and is manufactured in Switzerland for Compass Cameras Ltd., 57, Berners-street, London, W.1.

PRONTOSIL THERAPY

A READABLE review of experimental findings and clinical experiences recorded by those who have used Prontosil Rubrum, Prontosil Soluble, and Prontosil Album (sulphanilamide) and other preparations of this group of drugs has been compiled by the medical department of Bayer Products Ltd. of Africa House, Kingsway, London, W.C.2. The pharmacology, absorption and excretion, and mode of action of the compounds are discussed, and the results obtained by various observers in infections of various systems of the body are set out briefly and critically. The producers of these drugs are evidently anxious to prevent the disappointment that must result from attempts to use them promiscuously. It is made clear that in certain infections—for example pulmonary tuberculosis, syphilis, malaria, typhus—it is doubtful whether any favourable outcome of chemotherapy in this form is to be expected. There remains an impressive amount of evidence that its application may still be capable of vast extension. The booklet has a useful section on therapeutics, including notes on dosage schemes and estimation in body fluids and a discussion of toxic effects and the way to avoid them, as well as a list of references and a good index.

TESTS OF PHYSICAL POWERS

THE inhabitants of the United States take their sports and pastimes more seriously than we do. They even publish papers on grading student achievement in golf knowledge, they construct objective tests of knowledge and interpretation of the rules of field hockey, and they develop whole batteries of tests to measure playing ability in basket ball, achievement in archery, and skill in tennis, ice hockey, baseball, soccer, and a host of other games.[1] Perhaps they are right; perhaps, with a campaign for physical fitness in full swing, *we* ought to endeavour to measure its advantages and its effects. Those who think so will find this book useful. It tells of anthropometric measurements, of cardiac functional tests, of strength tests, of tests of physical efficiency, neuromuscular control, and the thousand and one indices of physical and athletic ability that ingenious, but not always very critical, workers have evolved.

OPEN-AIR NURSERIES IN LONDON

THE National Society of Day Nurseries (177, Piccadilly, London, W.) is attempting to establish shelters in the London parks where mothers can leave their children for a few hours in the open air while they do their housework or shopping. The equipment required is simple—a hut or tent, small chairs, tables and stretchers, an abundance of toys, and a plentiful supply of milk, rusks, and biscuits. A fee of a half-penny an hour is charged and a responsible staff has to be provided. In 1935 the L.C.C. put an enclosed site in Battersea Park at the disposal of the society and the nursery there has been so successful that the council have this year offered an additional site in Southwark. The society is hoping that sufficient funds will be forthcoming to allow it to take this opportunity of extending its activities.

[1] Tests and Measurements in Physical Education. Second edition, revised. By John F. Bovard, Ph.D., and Frederick W. Cozens, Ph.D., professors of physical education, University of California at Los Angeles. London: W. B. Saunders Company. 1938. Pp. 427. 14s.

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ADDRESSES AND ORIGINAL ARTICLES

THE NATURAL HISTORY OF STRAWBERRY NÆVI

By W. A. Lister, M.D. Camb., F.R.C.P. Lond.
HON. PHYSICIAN TO THE PRINCE OF WALES'S HOSPITAL, PLYMOUTH

The idea of this investigation arose at a meeting of the dermatological section of the Royal Society of Medicine, when Dr. Barber (1931) showed an infant who presented a very large number of prominent nævi. I was struck by the uncertainty of all those present as to the best line of treatment to be adopted, and as to what would happen if nothing were done.

Reference to the text-books gave little help. The classification and nomenclature of nævi was not clear, and remarks on prognosis were correspondingly vague. All text-books referred to the possibility of nævi disappearing spontaneously, but little indication was given how likely this was to happen, and all authors hinted at the possibility that nævi might continue to grow indefinitely. For instance, Sequeira (1919) states that:

"Nævi may disappear spontaneously, particularly the superficial variety, others remain stationary and others increase rapidly." Stelwagon (1921) mentions the tendency towards spontaneous involution, especially after slight trauma, but he states that the larger cavernous nævi are persistent, though they seldom show a tendency to increase. Wertheim (1932) quotes a number of authors who have described the spontaneous involution of nævi, with or without the assistance of minor traumata; on the other hand he lays considerable stress on the tendency of some nævi to grow.

MacLeod (1933) differentiates as regards prognosis between the capillary nævi, or port-wine marks, and the raised hæmangiomata (strawberry nævi). Of the latter he says that: "They usually increase in size for months, then gradually disappear spontaneously about the end of the second year. . . . They may, however, persist and become transformed into mixed fibro-vascular structures or lipomatous lesions." To illustrate this point he shows a photograph (p. 181) of what appears to be the late stages of a port-wine mark in an elderly man, and implies that it arose from a strawberry birthmark. No case-history is given.

Thomson and Miles (1916) state that fully half of all nævi undergo natural cure by a process of obliteration. Bland-Sutton (1912 and subsequent editions), after referring to the tendency to spontaneous involution, says: "Many examples have been recorded in which a nævus fleck in an infant has become a formidable tumour in the adult."

Nævi in infants are extremely common, and it was surprising to find how uncertain our knowledge of their natural history seemed to be. I had seen very severe scarring result from the radical destruction of nævi, and I had heard of two deaths. Drastic treatment which entails such risks should only be adopted if the condition is a desperate one, and precise knowledge of prognosis is essential to decide whether it is justifiable.

It struck me as remarkable that strawberry nævi, which are so common in infants, are seldom seen among school-children or adults. It seemed incredible that they were all successfully treated in infancy. I therefore decided to study the case records on which the statements in the text-books were based, and to follow up as large a series as possible of infants presenting strawberry nævi, without giving any treatment at all.

CLASSIFICATION

It will, perhaps, make the position clear to set down briefly the classification of nævi which was ultimately arrived at, and then to give the evidence on which it is based. The common types are:—

1. *Spider nævi*, which may appear at any age of life, never increase to any size, and consist of a central vein to which numerous tributaries converge. They are easily obliterated by destruction of the central vein. They show no tendency to spontaneous retrogression. They are not further considered in this paper.

2. *Strawberry nævi*, commonly called cavernous angiomata, are always to some extent raised above the general level of the skin. They are present at birth, or appear soon afterwards. They grow more or less rapidly during the first few months of the child's life, and thereafter invariably retrogress and disappear completely, leaving little or no trace, on the average about the fifth year of the child's life.

3. *Port-wine marks*, commonly classified in the text-books under the term "capillary nævi," are mostly found about the face and neck and are present at birth. They appear as sharply defined areas of intense erythema. They seldom extend in area, but show no tendency to spontaneous retrogression. As life advances they may become more prominent and develop a nodular surface. Occasionally they may become malignant. They are very resistant to treatment.

4. *Rare types.*—(*a*) Single, which ultimately develop into large tumours described as cirsoid aneurysms or cavernous angiomata. These are commonly present at birth or appear during the first year of life. They grow exceedingly slowly, in conformity with the growth of the child, and may so remain throughout life. On the other hand, after puberty, they may begin to extend, and in the course of years develop into very large tumours. (*b*) Multiple, in which the child at birth is covered with a large number of prominent nævi. These increase only very slowly, in conformity with the child's growth. They are associated with internal vascular tumours, which give rise to signs and symptoms according to their size and situation. Occasionally fresh crops or exacerbations may occur in association with pregnancy.

THE LITERATURE

To take the literature in reverse order.

Cases of *multiple nævi* are described by Govaerts and Cambier (1934) and also by Marinelli (1935). Both these cases followed the course just described and came under observation on account of symptoms and signs due to intracranial angiomata. One might include in this category the remarkable case recorded by Blaschko (1898). The patient developed an enormous number of small nævi during her first pregnancy at the age of 18. Barber's case quoted at the beginning of this paper may be a further example, but unfortunately it has been lost sight of (personal communication).

Single large angiomata.—The early history of these tumours was clearly of the first importance, and as many records as possible have been studied paying particular attention to this point.

Desjardins (1922) records a girl of 19 in whom the nævus had remained unchanged for 18 years. It then began to grow and was treated with X rays. Ultimately it became malignant. Oertel's case (1929),

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a man aged 44, presented a small purple spot on the back of his tongue at birth, which started to grow after puberty and finally involved the tongue, right side of the fauces, and uvula. In a girl of 14, described by Weichert (1928–29), the nævus appeared at the angle of her mouth, on the right side, at the age of 3. It slowly grew till it involved the whole of the right lower cheek and it became ulcerated. Demmer (1927) describes a man aged 41 who in infancy presented a nævus the size of a shilling, vivid blue-red in colour and slightly raised. It grew extremely slowly, in spite of igni-puncture at the age of 18 months. After an injury at the age of 24 it spread more rapidly.

Carramazza (1934), Urbach (1928–29), and Balban (1931–32) all record women who presented nævi at birth which remained unchanged until pregnancy, at the ages of 29, 26, and 23 respectively, after which the nævi began to grow and ultimately developed into large tumours. In a girl of 20, described by Demel (1933), a blue spot had been present over the right temple since birth, which grew very slowly. It was treated with radium at the age of 10 without result, and was then removed by excision. However, it recurred 7 years later and continued to grow.

Light (1931), Petrov (1934), and Müller (1892) all describe cases in which a small nævus remained unchanged until about the age of 16, and then slowly began to develop in the course of a few years into a large tumour. Le Roy des Barres (1927) seems to have come across a remarkable number of these tumours in his practice at Hanoi in French Indo-China. He describes seven patients with large angiomata in the region of the lips. They were present in infancy as small tumours, like a grain of rice or a little nut, and when they were treated, on the average at about the age of 12, they were about the size of tangerine oranges. His most successful results, by treatment with injections of quinine, are illustrated by good photographs.

The literature of *port-wine marks* is extremely extensive, and the condition itself is sufficiently familiar. Dramatic cases, in which these nævi have developed into enormous nodular tumours in later life, are described by Schilowzeff (1935–36), Proust and Martin (1921), Villard (1892), and Lecène (1925). I myself have seen a man, aged 38, who, at birth, had a port-wine mark over the right lower jaw and neck. It remained unchanged till approximately the age of 20, then gradually extended and became more prominent, with a nodular surface until, when I saw him, he was deformed by a deep crimson, lobulated, tumour mass involving the chin region and the lower halves of both cheeks. Most port-wine marks remain more or less unchanged throughout life, though the surface may become nodular. The only example that could be traced in which any retrogression was observed in a port-wine mark is described by Radcliffe-Crocker (1896), and even here the nævus did not entirely disappear.

Strawberry nævi.—There are many records of strawberry birthmarks and they fall readily into three categories.

First are the cases shown to medical societies to demonstrate the retrogression which may occur in these nævi as the result of spontaneous ulceration. A typical example is the case recorded by Danlos and Levy-Frankel (1908). Observations of this kind led to the practice of treating nævi by vaccinating over them. Many writers refer to the practice, among them Thomas (1924).

In the second category, the authors demonstrate the rapid growth which may occur in these tumours, in order to give force to their plea for early treatment by the method for which they may have a preference.

The patients are all infants in the early months of life. Examples are articles by Tangl (1928) and Thomas (1924). Schindler (1928) describes his method of operative treatment for nævi of the orbit in five infants. More recently, Finzi (1935) describes his method of treating these nævi with radium. He pleads for early treatment, and goes so far as to describe as "dreadful" the advice that parents should wait till the child is a few years older before active steps are taken. He presses for very cautious dosage and the avoidance of caustics or any procedure which might leave a scar. He points out that the effect of treatment is very slow, continuing for at least a year after the application of the radium, and advises that ultimately the services of a plastic surgeon may be required to complete the cure. He publishes some most admirable photographs showing the progress of six of his cases. He comments on the difficulty of obtaining equally satisfactory results in port-wine marks.

In the third category are records of the spontaneous retrogression of strawberry nævi. Patterson's case (1894) is a good example.

The patient was a little girl, in whom a nævus appeared over the right mastoid a few days after birth, and increased rapidly in size. It was lanced twice under the suspicion that it contained pus, and alarming and almost fatal hæmorrhage resulted. At the age of 4 months the nævus was eight inches in circumference, and at the end of a year it occupied nearly the entire side of the face. Growth had ceased by the age of 18 months, and by the age of 2 years it appeared to be retrogressing. At 4 years the lesion appeared as a pendulous, flabby mass on the side of the neck, and when seen again at the age of 15 all trace of it had disappeared.

It has proved impossible to find any record of a strawberry nævus which has continued to grow for more than a year (? 18 months, Patterson), or which, having grown conspicuously during early infancy, has failed subsequently to retrogress. The most detailed search of the literature has been made, for it was realised that the whole value of the investigation rested on verifying this particular point.

OBSERVATION

In 1931 I began to follow up a series of untreated nævi. Only those cases were selected which conformed to the following description. All the patients were infants or very young children.

Essentially the lesion consists of an area of excessive vascularity. The redundant vessels may be situated in the superficial layers of the skin only, or may be confined to the deeper layers and subcutaneous tissue. Commonly all sites are involved to a varying degree. The clinical appearance depends upon the site mainly affected. Even the most superficial type is always somewhat raised above the surrounding skin. The surface is finely lobulated, like that of unpolished shagreen leather. The colour is commonly a vivid crimson, but ranges from a bright scarlet to a deep purple. The nævus becomes more prominent and its colour more intense when the child strains or cries. In consistency it is soft and boggy, and in the most superficial types both swelling and colour may be almost entirely dispersed by pressure with a glass spatula, though this is not possible with ordinary degrees of pressure if the nævus is of any size. When the deeper layers of the skin and the subcutaneous tissues are involved, the nævus appears as a soft, rounded or lobulated elevation, showing a faint purple or lilac tinge. When both superficial and deep sites are involved, the nævus may be compared to a poached egg, the yolk being represented by the central, crimson nodular zone of superficial vascularity, which is superimposed upon a more

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extensive base of the deeper type, corresponding to the white of the egg.

Mothers who brought children with this type of nævus to the clinic were advised that no treatment should be given, as it was believed that the nævi would disappear spontaneously. This advice was particularly urged if the nævus was large or if its destruction might produce a disfiguring or disabling scar, or if the risk of sepsis appeared great, for instance when the lesion was situated in the perineum. Many mothers refused this advice and demanded active treatment. Others accepted it, but left the district before they could attend long enough to furnish a useful record. These have been excluded; but none have been discarded because they were observed to run a different course from the others.

The mothers who accepted the advice were questioned as to the age at which the nævus appeared and its progress up to the time of the visit. The nævus was measured in inches and a brief description recorded. The mother was informed that at six-monthly intervals she would receive a notice asking her to attend the clinic so that the nævus could be inspected regularly. Should she be concerned about it, or have any questions to ask, she could attend at any time. Accordingly, every six months a special clinic was held. Those children who were brought were seen personally and a brief note of progress was recorded. Those who failed to attend were sent a questionnaire, asking that the mother would describe the condition of the nævus at that date and give her opinion of its progress. A note was made in the record as to whether a description at any given time was the result of personal observation or a written statement by the mother.

The investigation has now been carried on for seven years. In summarising the results up to January, 1938, the cases have been classified under the following heads, indicating the condition at that date:—

1.—*No trace* means that either there is literally no trace whatever, or, more commonly, that, knowing where to look, one can just discern a few very faint telangiectases or a stippled scar resembling a faint vaccination mark. The appearance is so insignificant as hardly to be noticed unless specially looked for. The mother is completely satisfied, and it clearly is not justifiable to put her to the trouble of bringing the child for further examinations.

2.—*V.F.O.* indicates that more or less obvious discoloration of the skin is still visible, but the characteristic signs of retrogression have made their appearance and are progressing, and that the child is still under observation.

It is impossible to lay down a hard and fast line between this group and the first. In many of those cases classified as V.F.O. the nævus, which at one time was a prominent crimson excrescence, is represented by no more than a faint ring of telangiectases or a stippled lilac mottling. In others, which have been under observation for a shorter time, the changes are of course much less advanced.

3.—*V.F.L.* includes a small number in which the nævus had ceased to grow, characteristic signs of retrogression had made their appearance, and thereafter the children were lost sight of and could not even be traced through the post.

The series consists of 77 patients (see Table), of whom 1 will be dealt with separately as a possible exception. There remain 76 patients comprising 92 nævi, for several of the children had more than one. Of these 92 nævi, 49 have entirely disappeared and are classified as leaving no trace. Of the remainder 38 are classified as V.F.O. and 5 as V.F.L. Boys numbered 17 and girls 60, and probably this proportion is a fair indication of the sex-incidence, but it might equally well be interpreted as an indication that mothers are more concerned about the blemishes on the skins of their daughters than on their sons! In 4 cases spontaneous ulceration occurred and healed without difficulty in the course of a month or two under a simple antiseptic dressing. Those nævi which ulcerated spontaneously were of considerable size and prominence. The ulceration did not involve by any means the whole surface of the nævus and the scar which remained after it had healed presented a characteristic smooth dead-white surface, in clear contrast to the skin around it. At no time was there the least anxiety from hæmorrhage, extensive sloughing, or sepsis.

The nævus in Case 33 (see Table) and one other were unusual because they appeared during the second year of life.

The "exception" to which I have referred was a child seen for the first time at the age of 1 year, when the nævus measured 0·25 × 0·25 in., and had every appearance of a typical small strawberry nævus of the superficial type. The history was, however, unusual in that the mother stated specifically that the nævus had been present at birth and had remained absolutely unaltered in size and appearance. The case was seen early in the investigation and it was not then appreciated how important this point was to prove. This case was watched until the child was 5 years old, and still the nævus appeared precisely in its original condition, showing none of the changes which indicate the onset of retrogression. At the mother's request it was then successfully destroyed with CO_2 snow, leaving an inconspicuous scar. It is possible that this nævus might eventually have developed into a large tumour in adult life, perhaps in association with pregnancy. No harm resulted from leaving it untreated for five years.

All the other nævi—i.e., 92 out of 93—have completely disappeared or are well on the way to doing so, and all have followed an essentially similar course. They are either present at birth or appear in the first few months of life. Thereafter they increase both in area and in prominence, sometimes very rapidly. During this phase they become very tense when the child cries or strains, and the surface of the nodules is smooth and shining. The colour is an intense crimson. As the months pass the rate of growth becomes slower and finally ceases. No nævus has been observed to increase after the eighth month. Many cease growing before this and one was already starting to fade by 6 months. This phase of early growth appears to be an invariable characteristic of the type of nævus under discussion. Then follows a stage of variable length in which there is little change, but the colour begins to take on a bluish tinge and the shining tense surface becomes dull, rather like the bloom on a grape. The mother notices also that when the child cries and strains the nævus does not swell up in the same way as it did at first. Thereafter it starts to retrogress. Its area remains the same, but the swelling becomes less and less prominent. On palpation it feels flaccid and it does not fill up again so quickly when pressure is released. The surface becomes covered with tiny wrinkles, like that of a penny balloon which is being deflated. The uniformly tinted area begins to show a mottling of pallor and finally becomes broken up into an aggregation of flecks. The colour fades from bluish crimson to a dull purple and finally to lilac. These changes appear first in the centre and the process of involution spreads outwards towards the periphery. If the nævus has been a very prominent one it will appear at one stage as a wrinkled, flabby

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FIVE-YEAR OBSERVATIONS ON STRAWBERRY NÆVI. AS A REPRESENTATIVE SAMPLE EVERY FOURTH CASE IN THE SERIES OF 77 IS SHOWN

No. and sex.	Type.	Site.	At birth.	1–3 months.	3–6 months.	1 year.	2 years.	3 years.	4 years.	5 years.	Remarks
1 F.	(1) S.	(1) Back.	Both present.	Both growing.	Both growing slowly.	*(1) Stopped growing. 1″ × 0·75″	—	*(1) Flatter, fragmented. 1″ × 0·75″	*(1) Mottled spots.	Just visible.	V.F.O.
	(2) S.	(2) Right breast.	—	—	—	(2) 0·5″ × 0·5″	—	(2) Fine flecks only.	(2) Almost invisible.	—	No trace.
5 F.	M.	Tip of nose.	Small.	Growing.	*0·5″ × 0·5″ Very prominent.	*9 months. No further growth.	*Paler. Fragmentation starting.	*Slowly fading.	*Flecks only, nose almost normal shape.	—	V.F.O.
9 F.	M.	Vertex.	Pinhead.	*0·3″ × 0·2″	*Very prominent. 0·5″ × 0·7″	*Still very prominent, colour fragmented.	*Soft; dull yellow with lilac flecks.	—	—	—	V.F.O.
13 F.	(1) M.	(1) Right eyebrow.	Absent.	(1) Appeared 1 week.	—	*(1) Prominent. 1″ × 1·25″	—	No change.	*(1) Practically flat, flaccid mottled, lilac area only.	*Aged 6 years; no deformity; pink flecks round central bluish tinge.	V.F.O.
	(2) S.	(2) Back.	Absent.	(2) Appeared 1 month.	—	(2) Small, tense scarlet.	—	No change.	(2) No trace.	—	No trace.
17 M.	M.	Left chest.	Absent.	*Appearing.	—	*0·8″ × 0·5″ Very prominent.	*Fading. 0·8″ × 0·5″	*Same size shrivelling up.	*Flaccid, pale scar.	Faint mark like vaccination scar.	No trace.
21 F.	(1) S.	(1) Right shoulder.	All present.	All growing.	*(1) 0·5″ × 0·5″	*(1) Flatter. 0·4″ × 0·4″	*(1) Flat; erythema.	—	*(1) Flecks only.	—	V.F.O.
	(2) S.	(2) Left thigh.	—	—	(2) 0·5″ × 0·25″	(2) Fading.	(2) Faint erythema.	—	(2) No trace.	—	No trace.
	(3) M.D.	(3) Left axilla.	—	—	(3) 3″ × 1·25″	(3) Decreasing very rapidly.	(3) Flatter; speckled pink flecks.	—	(3) Quite flat; scattered flecks.	—	V.F.O.
25 F.	S.	Scalp.	Present.	*1·0″ × 0·5″	—	—	—	Entirely disappeared.	—	—	No trace.
29 F.	S.	Scalp.	Present.	*0·5″ × 0·5″	—	—	—	*No trace.	—	—	No trace.
33 F.	M.	Right buttock.	Absent.	Absent.	Absent.	Absent.	Appeared.	*0·5″ × 1·25″ Becoming flat and pale in centre.	—	*Much flatter; pink ring round pale centre.	Late appearance; V.F.L.
37 M.	(1) S.	(1) Right forehead.	All present.	*All growing.	—	*(1) 0·5″ × 0·75″	*(1) 0·4″ × 0·5″	—	*(1) (3), no trace.	—	No trace.
	(2) S.	(2) Right cheek.	—	—	—	(2) 0·5″ × 0·5″	(2) 0·5″ × 0·5″ Flat and fading.	—	(2) Few pink flecks.	—	No trace.
	(3) S.	(3) Right chest.	—	—	—	(3) 0·5″ × 0·25″ Fading.	(3) Flecks only.	—	—	—	No trace.
41 F.	(1) S.	(1) Right pinna.	Both present.	*(1) 0·35″ × 0·25″	—	*(1) 0·75″ × 0·5″	*Both fading fast.	—	—	—	V.F.O.
	(2) S.	(2) Right abdomen.	—	(2) 0·7″ × 0·7″ Both growing.	—	(2) 0·8″ × 0·7″ Both prominent, becoming mottled.	—	—	—		V.F.O.
45 M.	S.	Left chin.	Absent till 5th week.	Growing fast.	Growth ceased 6 months.	*Very prominent. Smooth deep purple. 0·5″ × 0·65″	*Less vivid mottled lilac.	—	—	—	V.F.O.
49 F.	M.	Right chest.	Absent till 5th week.	*Growing fast. 1·0″ × 0·5″	—	*Conspicuous fragmentation.	*Red flecks on lilac base.	*Few flecks on faint lilac base.	—	—	V.F.O.
53 F.	S.	Right upper eyelid.	Absent till 3rd week.	Growing slowly to 4th month.	Vivid crimson.	*0·2″ × 0·2″ Dull lilac.	*Flat; few flecks only.	—	—	—	No trace.
57 F.	S.	Margin left ear.	Present.	Growing.	*0·5″ × 0·25″	*Fading.	No trace.	—	—	—	No trace.

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FIVE-YEAR OBSERVATIONS ON STRAWBERRY NÆVI. AS A REPRESENTATIVE SAMPLE EVERY FOURTH CASE IN THE SERIES OF 77 IS SHOWN—(*continued*)

No. and sex.	Type.	Site.	At birth.	1–3 months.	3–6 months.	1 year.	2 years.	3 years.	4 years.	5 years	Remarks
61 M.	S.	Left forearm.	Absent till 2nd week.	*Growing. 0·75″ × 0·5″ Slightly raised.	*0·9″ × 0·75″ Surface dull.	*Conspicuous fading and fragmentation.	—	—	—	—	V.F.L.
65 F.	M.	Right wright.	Present; flat; crimson.	*Growing; raised. 1·75″ × 2″	*Growing fast; spontaneous superficial ulceration; healed 6 months.	*3″ × 2″ Very prominent with white central scar.	*Soft, flaccid rim of colour round margin.	*Colourless flaccid wrinkled swelling.	—	—	V.F.O.
69 F.	M.	Left labium.	Absent; "soon."	*Growing. 0·75″ × 0·5″	Grew till abouth 8th month, especially base.	*Centre fading; base very large.	*Centre pink, flaccid; left labium = × 2 right.	*No colour shrinking.	—	—	V.F.O.
73 M.	S.	Left thigh.	Present, very small.	Grew fast 2 months.	*1·75″ × 1·15″ Bright red.	*2″ × 1·5″ Becoming fragmented.	Fading.	—	—	—	V.F.O.
77 F.	S.	Sternum.	Present.	*Growing. 0·6″ × 0·4″ Prominent.	Growing.	Becoming paler.	*Purple patches and flecks.	—	—	—	V.F.O.

Key: Type S = Superficial. Type D = Deep. Type M = Mixed. * = Seen personally.

pouch of skin, yellow or dead-white in colour, with perhaps a few pink or lilac flecks on the surface, particularly around the margin. In the final stage, before all trace is gone, the colour may be paler than the surrounding skin, the surface depressed below the general level, and on palpation the skin feels thin and lax, as if the subcutaneous tissues were deficient. The surface is frequently dotted with little wrinkles and pits, resembling a vaccination scar.

The age at which nævi finally disappear is on the whole fairly constant. The great majority show either no trace at all, or are represented merely by a few flecks, by the end of the fifth year. Those which have been very prominent will, however, at this age, still be present as a pendulous, flabby pouch of skin, which will require a further term of years for its complete absorption.

It is very difficult to be sure how far, if at all, early treatment will prevent the growth of these nævi in the first months of life, for the obvious reason that one cannot know beforehand how large they would have grown without treatment. I can only say that a number of small nævi (not included in the present series) have been treated and to all appearance entirely obliterated with CO_2 snow, yet in the course of a few weeks a ring or crescent of fresh, nævoid tissue has appeared round the margin of the scar, and occasionally a very considerable cavernous base has developed beneath it. In one of the cases of the present series complete obliteration of the original superficial nævus did not prevent the subsequent development of a very prominent tumour which, however, ceased to grow during the second six months of the child's life and thereafter began to show the early changes characteristic of spontaneous involution.

Some of the cases are worthy of special mention.

Case 13 (see Table) when first seen at the age of 1 year showed a very prominent nævus over the right eyebrow, which hung down and almost closed the right eye. Little change was seen till the age of 3 years, after which involution was rapid. At the age of 4 the contour of the eyebrow was approaching that on the opposite side, and the skin at the site of the nævus showed the appearance characteristic of the final stage of involution. At the age of 6 the two eyebrows were symmetrical.

In another case, where there was a smaller nævus on the upper eyelid, there was some proposal to treat this by excision, but the surgeon agreed that it would be a mutilating operation, and would leave permanent disfigurement of the eyelid. This nævus faded rapidly during the second and third years, and by the end of the fourth year it had completely disappeared, leaving no deformity or trace of its presence.

A child first seen at the age of 2 months presented an extensive nævus around the base of the right thumb, on both palmar and dorsal aspects. The deeper tissues were not involved but the skin surface was prominent, nodular, and deep crimson. Here again treatment would have been extremely difficult and laborious, and if sepsis had occurred or the treatment had been too drastic, serious disability might have resulted. At the end of two years the contour of the skin was perfectly normal, and the nævus was represented by a few flecks of erythema only.

Case 21 (see Table) when seen at the age of 6 months presented a very large and prominent nævus over the left lower ribs. At the age of 1 year the change was most dramatic. The uniform, intense, purple surface had become fragmented and showed large areas of slightly yellow-tinted skin between the remaining patches of crimson. The underlying cavernous base was far less tense and prominent. Three years later no swelling was present, and all the colour that remained was a ring of telangiectases around the margin of the affected area. In no other case in the series has such a dramatic and rapid involution been observed at so early an age.

In one of the children the nævus was so big that it would have been almost impossible to treat. At the age of 6 months the whole of the skin covering the inner aspect of the left upper arm, axilla, and chest as far as the nipple was the site of a raised, intensely crimson nævus, "like liver" as the mother vividly

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described it. At the end of four years the area involved could just be traced by the presence of a few faint scattered flecks and telangiectases.

DISCUSSION

From a review of the literature, and study of the series of cases here recorded, it appears that strawberry nævi of infants have a natural history all of their own, entirely different from that of any other type. Their appearance has been described and need not be repeated. The essential point of distinction is that they enjoy a period of more or less rapid growth during the first few months after their appearance. This never continues for more than a year, and commonly it ceases between the sixth and eighth months. Thereafter retrogression sets in. Usually all trace of colour has been obliterated by the fifth year, if not earlier, and only in the most prominent nævi is a further term of years required for the final absorption of redundant skin. This is the explanation of the uniformly good results recorded by operators, whatever may be the method for which they have a preference.

Those nævi which have given rise to the guarded statements in the text-books, by developing into large vascular tumours in adults, have quite a different early history. Their precise appearance in infancy is not described in any detail but all accounts agree in stating that no appreciable growth takes place during early childhood.

Our whole attitude to the treatment of strawberry nævi must be based on the knowledge of their invariable tendency to spontaneous retrogression. As Finzi (1935) points out, the mothers are usually extremely distressed to see what, at the least, is a considerable blemish and, at the worst, a hideous disfigurement on their infants, and they are prepared to go to almost any lengths to have it quickly obliterated. Their distress is all the greater in the early months of life when they see that the nævus is growing, and there is no doubt that in the first few weeks of life this growth may be extremely rapid and disconcerting. It is easy to be stampeded into advising drastic and injudicious measures. If the nævus is relatively small and in such a position that its destruction will not entail the risk of sepsis or leave a scar which might be, in the least degree, unsightly or disabling, then no doubt it is as well to obliterate it forthwith. On the other hand, radical destruction of a nævus is unjustifiable if the lesion is so placed that the scar, which must inevitably follow such a procedure, is in the least likely to cause disability or disfigurement. Still more are radical destructive methods contra-indicated where the nævus is very large, for here such methods must, at the least, produce more or less gross disfigurement, and, at the worst, they may give rise to fatal sepsis or hæmorrhage.

If therefore the nævus cannot be quickly and safely obliterated, one's object must be to play for time. The mother should be reassured that however distressing the disfigurement may now appear, it will inevitably fade in due course, and one's object in advocating expectant treatment is to ensure that ultimately no unsightly or disabling scar will be left. As a rule mothers have been found grateful for this advice. They are not anxious to submit their babies to an operation, and they derive great comfort from a dogmatic assurance that the nævus will ultimately fade. Others, who are doubtful, have been encouraged by seeing at the clinic babies older than their own in whom the nævi are obviously fading, and by talking to their mothers.

Occasionally active treatment will be demanded, and then probably the wisest plan is to employ such measures as minimal exposures to radium or the injection of small quantities of sclerosing fluid, the application of a firm dressing, or painting with collodion or Unna's paste. Whatever is done must be so slight as to be entirely free from any risk of causing a scar. This line of action is made all the easier because the appearance of the nævus at any particular age can be more or less accurately foretold, so the mother's confidence will be gained when she sees the prophecy coming true, and she will be all the more ready to listen to counsels of caution.

It seems paradoxical, but it is none the less true, that there is more cause for anxiety if a nævus shows no active growth in infancy, for it is then unlikely to retrogress of its own accord. However, one can rest assured that even if it should start to grow it will not do so for many years, and then only very slowly. It can be dealt with deliberately when the child is older, and the method advocated by Le Roy des Barres would appear to offer the advantages of safety, simplicity, and economy.

SUMMARY

1. The natural history of strawberry nævi of infants has not previously been systematically studied.

2. The literature has been carefully searched and a series of 77 children, with 93 nævi, have been watched for periods varying from one to seven years.

3. No exception has been found to the rule that nævi which grow rapidly during the early months of life subsequently retrogress and disappear of their own accord, on the average about the fifth year of life.

4. It follows that drastic measures for the destruction of these nævi are inadvisable, and treatment should be expectant and conservative.

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INTRA-OCULAR PRESSURE IN NEPHROTIC ŒDEMA

AND ITS BEARING ON THE NATURE OF THE AQUEOUS HUMOUR

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THE interchange of fluid between the vascular system and the tissues throughout the body is governed by simple physical laws. The intra-capillary or hydrostatic pressure drives fluid and dissolved crystalloids through the semi-permeable capillary wall, while the colloid osmotic pressure of the plasma proteins attracts fluid into the capillary again and a small amount of tissue pressure drives it in the same direction. In health these opposing forces balance one another; consequently no stagnation of fluid occurs and there is a constant and continual interchange between the capillaries and the tissue spaces.

Since Epstein (1914–26) applied Starling's (1895) views to the œdema of nephrosis it has been recognised that a depletion of the plasma proteins can upset this normal interchange of fluid. Epstein stated that as a result of the massive albuminuria in nephrosis the plasma proteins became so reduced that the colloid osmotic pressure was unable to counterbalance the hydrostatic pressure in the capillaries. Thus there was a relative increase in the filtration (or hydrostatic) pressure over the absorptive (or colloidal osmotic) pressure of the plasma, and the result was stagnation of fluid in the tissues, made manifest by nephrotic or generalised œdema. Leiter (1928) gave the first direct proof that if the plasma proteins are reduced in the intact animal, œdema results. Œdema was produced in healthy dogs by bleeding them twice daily of 400–500 c.cm. of blood, and reinjecting the volume of corpuscles suspended in Locke's solution. Barker and Kirk (1930) confirmed these findings. Bennett, Dodds, and Robertson (1930) drew attention to the development of nephrotic œdema in plasma-protein deficit in consequence of extrarenal loss of protein such as is seen in rapidly accumulating ascites with frequent evacuation of the fluid.

It has been amply demonstrated by many observers that normally the osmotic pressure of the serum proteins lies between 25 and 30 mm. Hg, and that if nephrotic œdema is present the colloid osmotic pressure of the plasma is under 15 mm. Hg. Several of these observers were unable to explain why the fall in the measured colloid osmotic pressure is out of proportion to the percentage of total serum proteins. The anomaly was explained later by Govaerts (1925), who showed a relationship between the colloid osmotic pressure of plasma and the percentage of the individual serum proteins. He found that the smaller albumin molecule has a higher osmotic pressure than the larger serum globulin molecule. One gramme of albumin per 100 c.cm. gave an osmotic pressure of 5·51 mm. Hg, while 1·0 g. of globulin per 100 c.cm. gave an osmotic pressure of 1·43 mm.

In general terms, then, it may be said that whereas there are several other factors that influence the interchanges of fluid throughout the body, the plasma proteins play a very important part, and stagnation of fluid or nephrotic œdema appears when the colloid osmotic pressure of the plasma falls to 15 mm. Hg—in other words, if the albumin falls to 2 g. per 100 c.cm. and the globulin does not rise above 3 g.—i.e., insufficient to raise the colloid osmotic pressure above 15 mm. Hg.

THE PRESENT INVESTIGATION

For many years there has been controversy among physiologists and ophthalmologists regarding the formation of the aqueous humour, which has in turn been considered a secretion, transudate, exudate, and dialysate. More recent views are that it is a dialysate, and thus it is held that its formation is governed by the same simple physical laws that are applicable to the formation of tissue or œdema fluid and that have just been described. If the aqueous humour is a dialysate one would expect to find a raised intra-ocular pressure in cases of nephrotic œdema to correspond with the increased formation of tissue or œdema fluid present in this clinical syndrome. The following observations constitute an attempt to determine whether the aqueous humour behaves like a dialysate and whether the eye shares in the water-logging common to other tissues of the body where dialysis occurs.

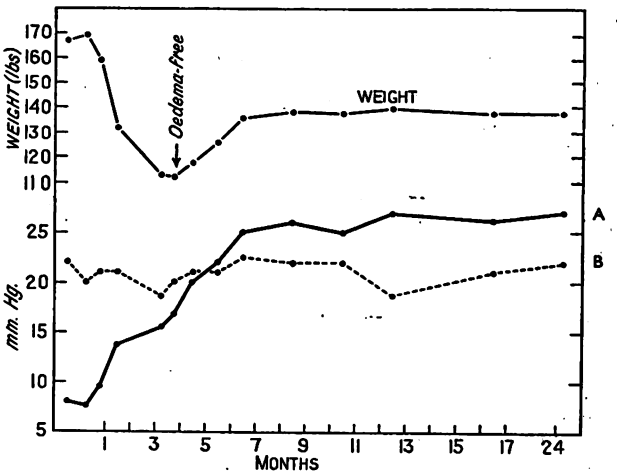

Chart showing changes in the patient's weight in the colloid osmotic pressure of plasma proteins (unbroken line, A) and in the intra-ocular pressure (dotted line, B).

Methods.—The intra-ocular pressure was measured with a Schiotz tonometer and the readings were translated into mm. Hg from a graph provided with the instrument. All readings were taken in the morning after the patient had been lying flat for twenty minutes. The colloid osmotic pressure of the plasma was determined by the method described by Govaerts (1925).

Results.—As a preliminary study, the intra-ocular pressure was measured in a series of 20 patients suffering from severe nephrotic œdema. All of them proved to have an intra-ocular pressure within average normal limits. It is recognised that the tonometer is not an instrument giving absolute and accurate measurements of the intra-ocular pressure, being influenced as it is by other conditions in the eye such as the elasticity, thickness, and circumference of the cornea. On the other hand, if tonometric readings are taken by the same observer on the same patient and with the same instrument, the observa-

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tions are of great relative value. It was decided to supplement the above observations by a study, if possible, of a case of well-marked nephrotic œdema from the stage of œdema to that of complete recovery. Lipoid nephrosis is a disease which may present the above conditions.

Mrs. A. B., aged 31, was admitted to Middlesex Hospital under the care of Dr. R. A. Young with gross generalised œdema, ascites, and hydrothorax. Her urine contained over 1 g. of protein per 100 c.cm. Clinically and biochemically she presented all the usual features of nephrosis. Under treatment the œdema gradually subsided and the accompanying Figure demonstrates the changes noted during her illness.

This patient's normal weight was about 136 lb. When first observed her weight was 169 lb. and as the œdema subsided her weight fell steadily to 112 lb. There was thus 57 lb. of œdema fluid retained in the tissue spaces of the body and she had lost flesh in addition to the extent of 24 lb. After the fourth month of her illness it will be noted she gradually regained her normal weight as clinical improvement took place.

When this patient was first observed the plasma proteins were so depleted that their osmotic pressure was only 7·5 mm. Hg as compared with a normal of 30 mm. On theoretical grounds, therefore, œdema was inevitable and it was in fact present in marked degree. The intra-ocular pressure was found to be 22 mm. Hg. As the plasma proteins gradually regenerated and their osmotic pressure rose, the œdema subsided, finally disappearing when the colloid osmotic pressure of the plasma rose above 15 mm. Hg. The work of previous investigators is thus confirmed—that there is a critical zone for the colloid osmotic pressure of plasma above which œdema disappeared. Throughout the progress of this case, no significant change was noted in the intra-ocular pressure, which lay between 19 and 22 mm. Hg.

CONCLUSIONS

The intra-ocular pressure has been measured in a series of cases with well-marked nephrotic œdema and it has been found to be within average normal limits. In addition, a case of nephrosis has been observed from the stage of severe œdema to complete recovery. As the plasma proteins gradually regenerated and their osmotic pressure rose, so the œdema subsided, but no significant change took place in the level of the intra-ocular pressure. The eye therefore does not share in the waterlogging common to other tissues of the body, and is unaffected by the failure of these factors which govern the normal interchange of fluid throughout the body. The equilibrium level of the intra-ocular pressure is not maintained by the hydrostatic pressure in the capillaries minus the difference in osmotic pressure between the aqueous and blood. These observations suggest that the aqueous humour can no longer be regarded as a dialysate.

It is a pleasure to thank Dr. R. A. Young for his kindness in allowing the investigation of one of his cases; and Prof. E. C. Dodds for his criticism of this paper.

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THE EFFECT OF POOR SOCIAL CONDITIONS IN THE PRODUCTION OF NEUROSES

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A GROWING bulk of articles reflects the interest shown in the influence of poor social environment on health. Writers, notably Burt (1937) and Cattell (1937), have studied their relationship to intelligence. Burt (1925), from his extensive work on delinquency, believes that in poor children this occurs where in the well-to-do nervous disorders occur. In a previous article (Neustatter 1937) I found evidence suggesting that certain nervous manifestations occurred particularly in debilitated working-class children. But, even after consulting learned colleagues, I have been unable to trace systematic investigations of the effect of poor social conditions on functional nervous disorders; hence this inquiry.

It was thought best to make a survey primarily of children, the reason being that in children it is easier to try to estimate the various factors involved. Thus home environment can be studied directly, and the parents interviewed about themselves and their children. For convenience in elementary schools, only children between 7 and 14 were investigated throughout. An answer was sought to the following questions: (1) Were poor social conditions productive of functional nervous disorders by acting in any of the following ways?

Directly physically—i.e., did bad economic circumstances appear to produce poor physical condition, and were there nervous symptoms that could be attributed to the physical state?

Directly psychologically: was there evidence to suggest that the children were reacting directly to the stress and worry of bad conditions?

Indirectly psychologically: were bad economic circumstances influencing the parents by making them worried, bad-tempered, alcoholic, &c., with a consequent harmful effect on the child's psychological condition?

(2) In addition (as a check) was there evidence to show that psychological home situations, *not* related to poor economic circumstances, were productive of neurosis or functional disorder?

Procedure

Three groups of 50 families were selected, as follows:—

GROUP I.—Poor working-class families in south-east London, picked at random. When the results were gone through 41 of the 50 had less than 10*s.* per head per week, and the other 9 less than 15*s.* per week. In another paper (Neustatter 1938) I have shown that 35 out of these 50 had not enough money for the B.M.A. minimum dietary requirements, and 19 out of 20 (selected at random) of these cases had not the minimum caloric requirements; 20 of the 50 were badly housed.

GROUP II.—From the parents of children attending two council schools draining "better" areas in south-east London, comprising small professional and clerical workers and artisan workers whose gross income fell between 55*s.* and £5 per week. The average income per head per week was 19*s.*,

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and 6s. 8d. per head per week was available for food. Only 3 came below the B.M.A. food-money requirements.

GROUP III.—A group of "well-to-do" families from a north-west London suburb. These parents were "middle-class"—i.e., professional workers, in business, &c. Their children attended two day schools in the district. The primary object of this group was to serve as a comparison with the poorer groups.

TABLE I—RESULTS OF QUESTIONNAIRE TO PARENTS

Groups—I, poor; II, middle-class; III, well-to-do

—	Groups—					
	I	II	III	I	II	III
Av. income per head per week	11/-	19/-	?	11/-	19/-	?
Money for food " "	3/6	6/8	?	3/6	6/8	?
	FATHER			MOTHER		
General characteristics—						
Unemployment (over 6 mths.)	21	0	2	—	—	—
Ill health	8	0	2	7	8	3
Insobriety	4	0	3	2	1	0
Unsteady	3	2	1	2	1	3
Unsociable	—	—	—	6	3	3
Bad tempered	8	0	17	15	3	13
*Anxious disposition	3	4	24	12	15	31
*Depressed "	4	0	9	7	4	8
Reaction to social factors—						
*Worried by social conditions	6	3	3	8	7	4
Depressed by " "	7	0	2	0	0	0
Resentful of " "	2	0	0	3	0	0
Worried about money	6	5	12	7	7	9
Worried about debts	0	4	0	0	0	0

* Defined in text.

In each group the mother was visited. Exigency made it necessary for a different social worker to visit Groups I and II, since after much searching it was impossible to find anyone with the time to visit 100 families. I myself had to visit the third group, who, it was felt, would see a doctor where they might not a lay worker. Occasionally the father was present, but in general we had to be content with the mother's account. A reference to Tables I and II will show the points inquired into. Some of these terms need definition.

TABLE II—PARTICULARS OF CHILDREN OBTAINED FROM THE PARENTS

Groups—I, 100 children; II and III, 70 children each

—	Groups—			—	Groups—		
	I	II	III		I	II	III
	Percentages.				Percentages.		
*Restless or irritable in first year of life	9	11	30	*Personality traits*—			
Difficulties at school age	4	6	8	Timidity	14	24	17
Anxiety symptom—				Shyness	19	34	14
Fears	21	25	32	*Aggressiveness	19	6	34
*Night terrors	4	4	29	Obstinacy	12	3	20
*Restless sleep	14	10	35	*Behaviour problems	10	0	27
*"Phobias"	0	3	8	Enuresis	14	11	11
Mood—				*Listlessness	8	0	0
*Instability of mood	14	6	48				
*Depression	7	0	0				

* = A "noticeable difference" between all or two of the groups (see text).

"Anxious disposition": the type of person who is generally apprehensive and tends to worry with little outside provocation.

"Depressed disposition": a generally melancholy outlook coming from internal rather than external factors.

"Phobias": fears that are severe and abnormal in the sense that they appear to have no rational foundation. If a child fears a man may come into the room in the dark, this is rational, inasmuch as such eventualities have probably been mentioned in front of the child. But a groundless horror of, say, "old men with white beards" comes into rather a different category. I consider it a more serious indicator of neurosis than the other type of fear, which is, after all, common to so many children.

"Unstable mood": a tendency to alternation of listlessness and excitement.

TABLE III—RESULTS OF INTERVIEWS WITH CHILDREN

Groups—I, 70 children; II, 60 children; III, 55 children

—	Groups—			—	Groups—		
	I	II	III		I	II	III
Fears of—				*Child's account of*—			
Dark	49	48	52	FATHER			
Noise	17	23	2	Often worried	26	24	32
*Teacher	21	12	9	noticed *depressed	17	20	2
*Father	21	10	17	Seems *lack of			
Mother	4	9	6	worried work	21	5	6
*Punishment	27	20	7	about money	8	3	0
Animals	14	15	17	MOTHER			
Other fears	6	7	38	Often worried	34	41	40
"Phobias"	0	3	11	noticed *depressed	15	7	6
Worries about—				Seems *lack of			
Work	33	23	40	worried food	20	1	0
*Exams.	30	30	17	about *money	27	11	4
*Worries generally	6	11	36	*Child has noticed*—			
				*Felt "not enough to eat"	21	0	0
				*Worried "there might not be enough to eat"	11	5	0
				*Parents worry and therefore child also worried	8	16	26
				Parents quarrel	17	26	—
				Child worried because they quarrel	8	11	—

* = A "noticeable difference" between all or two of the groups.

There is, of course, no quantitative measure of any of the characteristics recorded, and examples were asked for to see to what the parent was referring. If in my opinion the examples were too trivial, the trait was not marked down.

At a later date I saw the child myself, without any notes of the parental interview, and after putting it at ease by a little general conversation, certain questions were asked about fears and worries and other expressions of anxiety. The child's observations on conditions of life, and what, if anything, they noticed of parental reactions—e.g., worry, moods, quarrelling—were also recorded. In the poor groups they were asked if their parents seemed worried about how much money there was, or about getting food, and whether they themselves ever thought there was not enough to eat. If positive, their answers were amplified to see on what grounds they gave such a reply (see Table III). Leading questions were rigorously avoided during this part of the investigation.

Observations on the child's conduct and reactions to my questions were noted, and my own estimate of the child as "nervous" (N), "partially nervous" (N/2), or "not nervous" (O) were put down at the end of the interview (Table IV).

"N" indicated that I felt the child was definitely anxious, definitely a worrier, or exhibited some

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TABLE IV—ESTIMATE OF N, N/2, AND O

—	N	N/2	O
70 Group I children ..	14	16	40
Per cent.	20	24	56
60 Group II children ..	10	23	27
Per cent.	16	39	45
55 Group III children ..	20	16	19
Per cent.	38	26	36

other characteristic usually referred to as nervous—i.e., an inability to sit still, excessive shyness, or inhibition in reply, or, at the other extreme, a tendency to talk and behave "over-excitedly." In coming to these conclusions I was influenced by the quality of these characteristics—i.e., the type of fear, e.g., of the dark; whether it was just mild apprehension, or fearfulness of something terrifying occurring, as well as the frequency of their occurrence, also how long it had persisted, facts that it is impossible to record satisfactorily numerically. Consequently, in some cases I may have found a child nervous where Table IV records few instances of fear or worry—because one example was very well marked—or, conversely, not nervous.

"N/2" meant *some* nervous features, but not definite enough to be labelled unhesitatingly as nervous. I reserved this for *all* doubtful cases, which did not come definitely into either of the other categories.

"O" was reserved for either no nervous features at all, or for the presence of only some minor symptom, such as a transient fear of the dark at some time.

As in a previous communication (Neustatter 1937) I felt the "O's" the easiest to estimate, and therefore the most satisfactory.

RESULTS

To save space the reader is referred to the Tables for details of the results. Where there are noticeable differences an asterisk is shown. The statements recorded, depending on questions which might have a different meaning to different classes and which were put by three different observers, did not appear to justify dealing with these differences statistically, which would tend to give a spurious sense of accuracy. Here attention is drawn to certain points:—

Table I (certain information has been omitted—viz., marital and sexual relationship; as at one interview it proved impossible to get satisfactory information): (1) The striking difference in money available for food. (2) The greater frequency of worry in general in the parents (and temper in the father) in Group III. (3) The infrequence of depression, insobriety, and unsteadiness throughout. (4) Infrequence of worry about money in Group I. The latter does not tally with the child's account in Table III. I am inclined to believe the positive statement of the child. Table III shows there is worry about food in 20 per cent. of mothers in Group I, who have only 3*s.* 6*d.* a head per week for food; 11 per cent. of children in this group have worried *in case* there should not be enough food, and 5 per cent. in Group II, but 21 per cent. in Group I remarked there *was* not enough food, a statement recorded in no other group. These 21 per cent. were not identical with the 20 per cent. of children who stated their mothers worried about getting enough food.

The differences in Table VI were tested by the χ^2 method, which showed a statistically valid relationship between the presence of worry in the parents and worry and fears in the children, *irrespective of* class. (In this case, unlike Table I, I had seen all the children myself, and assessed their answers myself.)

General Discussion

The dangers of any questionnaire are sufficiently well known not to need discussion. Certain possible specific sources of error, however, do need to be discussed.

Firstly (as stated) the three groups of parents were interviewed by different investigators, but since all were experienced in psychiatric history-taking I see no reason to suppose that any one group of the histories obtained differed greatly from the others on this account.

Secondly, the possibility arises that the positive findings recorded from interviewing the parents in Group III are greater, not because they were actually more often present but because the greater intelligence and education of the parents in this class, and their greater leisure and smaller families, leads them to notice what in the poorer groups passes unnoticed. Similarly lack of education might be responsible for negative findings in Groups I and II, but I find it hard to believe experienced psychiatric workers would consistently have failed to obtain information. Moreover the lack of these signs of an underlying nervous instability in the poorer children, and their presence in the well-to-do, were supported by my own findings when interviewing the children. The possibility that this extra attention to certain characteristics—especially nervous ones—might itself actually have produced them demands consideration, i.e., the symptoms recorded may have been *actually* present but caused—or at least developed—by this extra attention.

A difference in outlook and accepted standards of behaviour in the different classes are a source of difficulty, but again the use of trained investigators should as far as possible have mitigated discrepancies in the criteria adopted.

In spite of these sources of error—certain of them unavoidable, like the difference in education and outlook of the parents—the results appear to give a reasonable representation of the state of affairs in the different groups.

The fact that there is a discrepancy between the greater amount of "actual" worry—e.g., worry about work or exams—in Group I, compared to worry in general in Group III, requires comment. It may be that the worry was focused on the *actual* situation in the poor groups where scholarship exams loomed large, compared to the freer schools in Group III. In this freer atmosphere the anxiety may have left more to "float." Having discussed these possible sources of error, what emerges from the findings and how far does it answer the questions postulated?

TABLE V—PHYSIQUE (50 CHILDREN IN EACH GROUP)

—	Groups—			—	Groups—		
	I	II	III		I	II	III
Very good ..	2	6	13	Pallor ..	12	0	3
Satisfactory (average)	31	28	33	Tired facies ..	18	6	3
Poor	17	16	4	Lined „ ..	11	4	1

DIRECT PHYSICAL EFFECTS

That there is a physical difference between the two groups of poor children and the well-to-do is shown by Table V. "Poor physique" occurs in about 1/3 of the children in the poorer groups, and in hardly 1/10 of Group III children, and pallor and tired and

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lined facies are found practically only in the poorest group. As stated before, the average amount of money available for food in Group I was 3*s.* 6*d.* per head per week, compared with 6*s.* 8*d.* in Group II (it was not estimated in Group III). In Group I 35 out of 50 families had insufficient money for the minimum B.M.A. dietary requirements. There are then certain definite physical differences and dietary insufficiencies in this group. Yet it is only in regard to fear of noise, worry about exams, and fear that there may not be enough food that there is any evidence of increased "nervousness" in the poorest group. Taking the latter points, worry about exams was probably almost entirely a matter of individual schools. The fact that only 8 out of 71 worried that there would not be enough food—though the figures were too small to make it possible to analyse them satisfactorily—shows it was not an important factor in determining nervousness, and (as stated) only 1 of these 8 was definitely nervous.

In Group I 20 of the 50 case-histories showed very bad home conditions, and of these 11 children were marked definitely "not nervous." Only 14 out of 71 of the Group I children were definitely "nervous," while 40 were definitely "not nervous." All this points to the fact that although poor physical condition may be the result of poor social conditions the evidence does not suggest that either the poor social or the poor physical condition are, in general, determinants of nervousness in the children.

DIRECT PSYCHOLOGICAL EFFECTS

It has been seen from the foregoing that in general children from Group I were more free from nervousness than those of Groups II and III. Nevertheless, bad environment might be responsible for the cases of nervousness which did exist owing to a direct psychological effect on the child, or (as postulated) by the psychological situation produced by affecting the parents. These two aspects are apt to be inter-

psychological situation produced by affecting the parents. These two aspects are apt to be inter-

twined, and are therefore discussed together. They can also probably be approached more satisfactorily by consideration of individual case reports. The first histories are instanced to show how, in spite of conditions that justify the use of the word dreadful, the children can remain quite free from symptoms of nervousness.

CASE 49.—A family of seven; gross income 35*s.*; rent 11*s.* 6*d.*; living in a squalid, damp tenement. There was no copper and no drying space, and until recently the lavatory was in the yard. One has been built into the flat since, and as a consequence the rent was 11*s.* 6*d.* instead of 8*s.* 6*d.*

The father was an apparently placid labourer. The mother was quiet, gentle, and intelligent. She was chiefly concerned with keeping the children clean with no bath, and how she and her husband could bath privately, since the bath-tub could only be put in the living-room, which meant shutting five children into the bedroom with no fire. She was also concerned because with the window open the house became inundated with flies.

The three children seen were all normal in their early psychological development, and were marked "not nervous." All three stated that they were sometimes short of food. Only one (girl aged 8) was inclined to worry over the state of affairs, as "mummy don't have enough money, and she keeps on getting worried because she don't have much money for dinner. Last Saturday she had to get corned-beef and bread." Normally they would have had a "proper dinner"—meat, potatoes, and greens.

CASE 48.—A family of nine, both parents were psychologically normal, so was the early development of the three children seen. They lived in three small squalid rooms, with inadequate domestic facilities, yet well kept. Robert, aged 12, and his brother slept in the kitchen, the rest slept in the parents' room, and Robert's comment on this was "it ain't fit." May, aged 9, shares a bed with one sister and two brothers, and objects to the latter! The father has been out of work, and M. is concerned about this. "He don't give mummy enough money for dinner. He says he can't earn it." May has not noticed whether her parents appear upset about this. Joan, aged 8, does not like the rooms as they are too small. Also, "Mummy don't like them because of the factory outside from which rats come in. They frighten my big sister, but not me." J. also remarks: "Dad hasn't much money for dinner. We didn't have enough yesterday or the day before. We had sausage and mashed not chops and greens. I didn't say anything because mummy would jaw me. She says: 'You'll have to have what I give you, as dad ain't got much money.'" J. said she felt hungry and continued: "Mummy sometimes don't have no dinner, but has some fish from the stores. She let's us have our dinner first. I feel sad when mummy has no dinner." I have given this statement verbatim as it was told to me. I took care to put no leading questions. The statements of these children were made in a detached unemotional way. All three were marked "not nervous." The squalor, the struggle for existence, and the shortage of food appeared to be so much part of their existence as to call forth little comment and no emotion.

It is apparent, then, that the direct psychological effect of very bad environment is in itself not necessarily a cause of nervousness.

Next, it would be profitable to select some cases in this group from the ones labelled "nervous" and see what facts emerge.

CASE 13.—A boy of poor physique, pale and tired-looking, whose parents were separated six years previously on account of alleged cruelty by the father to the mother. The mother lives with another man, and the boy consequently lives with his grandmother. Her income is 45*s.* a week. She is tearful, depressed, and resents the boy, and declares that she only keeps him because some day he can keep her, and fears his father may claim him "just when he may be of use" to her. The child's early development was normal, but he had recently been getting restless and unstable in mood, and suffers from numerous fears, especially of his grandmother, who rubs in: "Five shillings a week ain't enough to keep you on."

In this case the social worker formed the impression that with more money in the house there would be less antagonism to the boy, and to this extent economic environment played a part. But the breaking up of the home and the fact that the mother lives with another man are psychological factors of great importance, and though in better circumstances matters would undoubtedly be easier for the boy, the emotional consequences would probably be the same.

CASE 31.—A boy, aged 8, lives with his mother who earns 27*s.* 6*d.* a week; 7*s.* 4*d.* rent. His father, a violent alcoholic, deserted five years previously. The mother is very resentful and bitter in consequence, and says the boy is exactly like his father. She is over-anxious about the boy. She leaves home at 6.30 A.M. for cleaning work, and returns at 8 o'clock to see him off to school, and then works the rest of the day as a school cleaner till 8 P.M. A "taciturn, hard-faced aunt" helps in the house.

The child's early psychological development was normal, but he has become over-active, his moods are unstable, he sleeps restlessly, and suffers from tics. An unhappy nervous child, he fears his mother

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—who, he says, has twice thrown a knife at him—and twitches continually while speaking. He says his mother has not enough money to get food and at times she borrows from his money-box.

Here again it is difficult to escape the conclusion that the desertion of the father and the state of mind in which it has left the mother are of primary importance as psychological causes of the boy's condition. Her bitterness and violence are directed against the boy, who consequently fears her. Nevertheless, economic factors also appear to play a rôle. The hours she works must surely be fatiguing, and add to her temper, and the taciturn aunt is the outcome of her absence. That a mother should have to borrow off her 8-year-old son to pay for food is clear evidence of financial stress.

Though the economic conditions are bad in this last case, they are no worse than in those cited above, where the children were free from nervousness. It seems reasonable, then, to argue that the difference lies in the psychological state produced in the mother by the husband's desertion, and her antagonism, temper, and over-anxiety about the son. Both these cases suggest that poor environment in itself does not have a direct psychological effect. (But I must qualify this by remarking that I can recall several cases of adults telling me how worried they were by poverty as children.)

INDIRECT PSYCHOLOGICAL EFFECTS

Where circumstances have contributed to making an unhappy home, they can to this extent be held responsible, but probably only when there is a parental predisposition. Placid individuals seem to be able to survive surprising economic hardships. The following case furnishes a very good example of how economic circumstances can act *indirectly*, but how, also, a previously nervous disposition was present in both parents. It also shows what great suffering circumstances can inflict on nervous and sensitive individuals.

CASE 56.—The father, aged 34, was once a full-time boiler-maker, but had obtained only casual work for four years, averaging 30*s*. a week. He now works for £3 a week. While unemployed, according to his wife, he once got very depressed, and declared he was no use, as he could not get work. "How would you feel in my position, depending on other people for clothes to wear?" he demanded. "I should be *buying* things, not taking them." While in this mood he attempted to injure his wife with a hammer, and to strangle her. The husband denied being more than a little anxious at times—"I don't let thoughts of unemployment enter my head"—but declared that he had had fits of depression and terrific headaches all his life, and in the last ten years has been depressed one day per week. He gets very irritable, especially with his wife. As a child "the fear of a hiding" helped his self-control. His father was an equitable man; his mother "a very broody woman." His wife, though contained, is obviously very anxious and remembers at the age of 9 being sick and unable to eat when she had to go to dinner with her teacher. She feels sick and shaky before coming up to hospital. She often, during her husband's unemployment, wondered where the next meal was coming from. She had to get artificial food for the children, and sometimes there was not enough for her husband. She would feel bitterly: "Why should it be our lot? It isn't as though we don't try." Sometimes she could have cried, but her husband's dislike of tears restrained her. At the last minute, she said, something generally happened, and she eventually got accustomed to conditions. But now she feels she could not face such times again, "though I suppose I'd have to. But it certainly is a load off my mind since the unemployment stopped."

This case illustrates the interplay between intrinsic and environmental factors. It is quite obvious that the unemployment, and not only the financial stress, but in the father's case the humiliation to his pride—"I should be buying, not taking"—had a marked effect in making him irritable and bitter. The wife suffered exceedingly from the anxiety produced by the unemployment. Yet the history clearly shows that the husband was moody and irritable all his life, both before and after his unemployment, and that his mother was also a moody woman. The wife also gave a clear history of nervousness before the time of financial stress. Here the bad economic circumstances were responsible for considerable worry and depression, but although they produced severe reactive symptoms, a history of "nervousness" long preceded the time of unemployment.

EFFECTS OF ENVIRONMENT ALONE

Finally, to answer the fourth question—How far does home environment, irrespective of economic circumstances, play a part?—a short study of the two better-off groups seems apposite. I had hoped in the middle group to get mainly the clerical and small professional worker to study the effect of conditions where appearances had to be kept up on small means, but a random selection of cases produced only 12 of these, the rest being artisan workers. Amongst them, however, there were two rather striking instances of the effects of "too much parent," of the type who are over-concerned about their children, both of them of the small professional class.

In one case, an ex-sergeant, who was a strict disciplinarian, gave his son frequent "good hidings," and to cure the boy of a fear of the dark locked him in the cellar. The boy was highly nervous.

In another case, a teacher was very concerned how his son (aged 10) did at school; both parents were over-anxious whenever the boy was hurt, took him into their bed for nervousness, and caned him for biting his nails. This boy was over-anxious and very concerned about himself. Treatment of this nature did not feature in the other groups.

Both these cases furnish examples of the type of factor which clinically always appear as important in the production of nervousness, and are independent of economic conditions.

TABLE VI—FEARS AND WORRIES IN THE CHILDREN COMPARED WITH WORRY IN PARENTS (ACCORDING TO CHILDREN'S STATEMENTS)

Child.	Parent.	Groups— I	II	III	Total.
Fearful ..	Worried ..	26	17	20	63
	Not worried ..	10	7	8	25
Not fearful ..	Worried ..	15	11	10	36
	Not worried ..	20	24	18	62
Worried ..	Worried ..	24	18	26	68
	Not worried ..	13	12	13	38
Not worried..	Worried ..	15	12	6	33
	Not worried ..	19	17	11	47

Worry on the parent's part was the child's observation.
Child "fearful" means there were two instances of "fears" recorded—i.e., dark and noise—in Table III.
"Worried" means one instance of worry was recorded in Table III.

In interviewing the parents in Group III, I was struck by the effect that education had on the mothers' outlook. Where the working-class mothers were more occupied with the struggle for existence, the well-to-do had more time to be

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concerned with their children, and in this class one strong impression I formed was of a battle of wills, an unconscious tendency for the mother to impose her will and try to mould the child, with a consequent reaction on the child's part, sometimes of anxiety, frequently of aggressiveness. The increase in nervousness, and the falling off of the not-nervous, in this group goes to show that factors other than economic must be determinants in producing nervousness.

In this connexion it might be well to stress the importance of Table VI, which shows a statistically valid relationship between worry in the parents and worry and fears in the children, irrespective of social class. How far this nervousness is the result of heredity, how far due to the psychological home situation is a question outside the scope of this inquiry, which is essentially concerned with the rôle of poor social conditions.

Conclusions

1. In a poor group of 50 families, 20 were badly housed, 35 had insufficient money for food, and about one-third of the children were of poor physique. But only 20 per cent. of the children were nervous and 56 per cent. were *not*, compared with 38 per cent. nervous and 36 per cent. *not* nervous in 50 well-to-do families. Therefore poor social conditions are not in themselves a direct determinant of nervousness in children.

2. Case-histories showing even very bad social conditions left children unaffected psychologically, provided the psychological home situation was good. Therefore there was no *direct psychological* effect.

3. *Indirectly* social circumstances at times affected children through the parents, but surprisingly little, and generally when parents were already nervously predisposed. In adults of an anxious disposition economic conditions can produce severe reactive states, anxiety, depression, and unhappiness.

4. There is a statistically significant relationship between the presence of a worrying disposition in the parents and the presence of anxiety and a tendency to worry in the children, irrespective of class.

This inquiry was carried out with the aid of part of a grant to the Department of Psychological Medicine, Guy's Hospital, from the Rockefeller Foundation and the York Trust. I would like to thank the following for their help: Dr. R. D. Gillespie, from whose department at Guy's Hospital the research was undertaken; Dr. C. J. Thomas and Dr. H. R. Kidner of the L.C.C., from whose schools many of the children came, and to Miss Cosens, district organiser; Miss M. L. Ferrard; and Mrs. Dorothy Smith, who worked very hard in collecting psychiatric data from the parents; the various head teachers who coöperated, but whom I cannot mention by name for the sake of the anonymity of those investigated; and Dr. E. Slater for statistical advice.

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SOUTH AFRICAN PUBLIC HEALTH APPOINTMENT.—Dr. E. H. Cluver has been appointed secretary for public health and chief health officer of the Union of South Africa in succession to Sir Edward Thornton, who is retiring. Dr. Cluver is at present director of medical services of the Union Defence Force and senior assistant health officer for the Union. He formerly held the chair of physiology in the University of Witwatersrand.

ACUTE LYMPHATIC LEUKÆMIA IN CHILDHOOD

BY F. DUDLEY HART, M.B. Edin., M.R.C.P. Lond.
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ACUTE lymphatic leukæmia in childhood is often very difficult to diagnose. The typical blood picture may only be present for part of the time or may be entirely absent. The total white cell count may be increased, normal or reduced, and there may be no true lymphocytosis. Gittins (1933) suggests three subdivisions: (1) leukæmic lymphadenosis, where total white cells are increased by an increase in lymphocytes; (2) leucocythæmic lymphadenosis, where the total white cells are not increased, but there is a relative lymphocytosis; and (3) aleukæmic lymphadenosis where there is no increase in lymphocytes. Most cases pass through more than one stage, as those reported below illustrate, and the subdivision seems an artificial one.

The great and often erratic changes of the white cell count of a normal child in various infections and other conditions are well known, and similarly great variations take place during the course of acute leukæmia in a child. Glandular enlargement, hæmorrhages, and other classical symptoms may never be present, and a temporary response to blood transfusions, iron and liver therapy does not negative the diagnosis.

The combination, anæmia plus neutropenia, is often the precursor of anæmia plus lymphocytosis, and should be enough to suggest the diagnosis. Whenever there is a doubt sternal biopsy should be performed, and this will often clinch the diagnosis; but some cases cannot be diagnosed with certainty until a few days before death and some only at autopsy.

Two cases are reported below which presented unusual features. Both were watched for several months as they gradually progressed in the leukæmic state and in both the diagnosis was at first uncertain. Most clinicians will have seen similar cases but the diagnosis is sufficiently often missed to warrant their publication.

CASE RECORDS

CASE 1.—A boy aged 5. One uncle had died of ? Addison's anæmia, otherwise the family history was irrelevant. His birth had been normal and his infancy uneventful. He had been breast-fed for nine months. He had always been rather a pale boy and never quite as strong as his sister.

In December, 1935, a right mastoidectomy was performed, and he made a normal immediate recovery, but never picked up properly afterwards. He failed to gain weight and contracted measles in March and whooping-cough in May. He was seen in August by the school doctor, who noted quite a decided pallor, but considered him fit to attend school. On Sept. 16th, 1936, he and his sister contracted a febrile illness with cough and headache. The sister made a good and rapid recovery, but the boy became heavy and drowsy.

On admission to hospital on Oct. 30th he was very pale; temperature 103·2° F.; heavy and apathetic; coughing frequently and complaining of headache. Crepitations were present at both bases. No glands were palpable, the spleen could not be felt, but the liver was enlarged 3–4 fingers-breadth. Both fundi showed an œdematous-looking retina and a few scattered hæmorrhages. Both optic discs appeared to have blurred edges. Wassermann reaction negative. Lumbar puncture normal. Four days later the transfusion of 300 c.cm. of his father's blood

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brought about a dramatic change. The temperature fell to normal (Fig. 1), and he became cheerful and played normally. His spleen enlarged, became easily palpable for several days, and then disappeared. This was only accompanied by a rise of hæmoglobin from 25 to 30 per cent. (Fig. 2). On Nov. 9th a second transfusion was performed. Fractional and histamine test-meals showed no free hydrochloric acid. The hæmorrhages had disappeared from the retinæ,

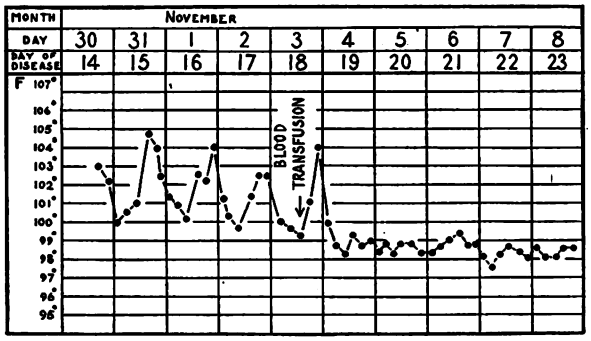

FIG. 1.—Effect of transfusion on temperature in Case 1.

which still had the iridescent appearance associated with an anæmia. On Dec. 10th he again became febrile, his fauces were congested, and his spleen enlarged. The fauces gave a profuse growth of hæmolytic streptococci. Fourteen days later a left otorrhœa developed, both parotid glands became large and tender, and enlargement of submaxillary, sublingual, and lacrimal glands, and axillary, cervical, and inguinal lymphatic glands followed. The liver and spleen were now down to the umbilicus. A transfusion of 300 c.cm. of his father's blood brought the dramatic response seen before, but the temperature still ran between 98° and 100° F.

After a gradual improvement, accompanied by a decrease in the size of the parotid glands and an increase in the size and number of his lymphatic glands, his temperature rose on Jan. 17th to 105° F., with pain in the left parotid, dry mouth, spongy gums, fœtor oris, and further increase in lymphatic glands. A radiogram showed enlargement of the mediastinal shadow. The left otorrhœa began again and a week later his left parotid broke down and discharged pus. Four days later he contracted an acute respiratory illness and died within 36 hours. No autopsy was performed. The blood counts are given in Table I.

CASE 2.—A girl aged 6. No relevant family history. She had always been pale and thin. No previous illnesses. Her tonsils had been removed. Three weeks before admission her cervical glands enlarged and her mouth became ulcerated. The condition of the mouth cleared up quite rapidly but the child remained weak and ill.

On admission to hospital on March 19th, 1935, she was a pale, thin child. Temperature 102° F. A few small glands were present in neck, groins, and axilla, but the spleen was not palpable. A presystolic murmur was heard at the cardiac apex. The fever continued, and the temperature was only brought down for 24–36 hours by a transfusion of 350 c.cm. of her father's blood. She had a cough, and her gums began to bleed. Crepitations were heard at both lung bases. A second transfusion had a much greater effect. After treatment by blood transfusions, iron, Marmite, and Hepatex her hæmoglobin rose to 70 per cent. and she was discharged.

Blood counts were repeated at out-patients and the improvement continued for a while, but after reaching a point where her hæmoglobin was 88 per cent. and red cells 4,920,000 she relapsed. Her glands became gradually larger and her gums became spongy and bled at a touch. A swinging temperature commenced, and she was readmitted on July 5th with ecchymosis of body and face. She died four days later.

At autopsy there were extravasations of blood in both orbits. The face was œdematous, and extensive areas of purpura were present on trunk and thighs. Severe œdema of the lungs and extensive hæmorrhages on the epicardium were found. There were large gland masses on both sides of the jaw and neck and smaller discrete and soft glands round the trachea and œsophagus. The spleen was not enlarged. The brain showed a large hæmorrhage in the region of the internal capsule.

Microscopically the changes were everywhere typical of lymphatic leukæmia.

Her blood counts are shown in Table II.

DISCUSSION

These two cases illustrate certain points well. The extraordinary response to blood transfusion seems to have been largely due to reduction of the temperature, for it was when a high temperature was reduced to normal that the vast improvement in the children took place. The increase in red cells and hæmoglobin did not seem to be an important factor in this improvement, for least improvement was seen after the greatest rise, nor did the increase of neutrophils per se effect this change.

The splenic enlargement in Case 1 after the first transfusion was transitory and was not seen again until the later stages when the boy's glands became enlarged, but there was slight hepatic enlargement throughout. The history of this patient is interesting, in that after a period of ill health following mastoidectomy he had two illnesses associated with a monocytic

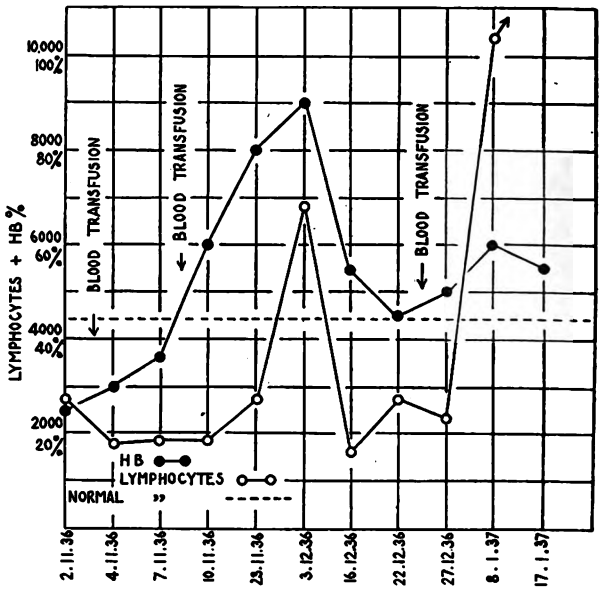

FIG. 2.—Effect of transfusion on blood counts in Case 1.

blood reaction, and from this time he was a pale sickly child, reacting excessively to any infection, but responding well to treatment until latterly. It is almost as if he had been buffeted into the leukæmic state. The axillary, cervical, and inguinal lymphatic glands enlarged only a month before the end. Not until three weeks before his death did his circulating lymphocytes increase, and not until then did immature cells appear in the blood smears. Up to then anæmia plus neutropenia had been the characteristic findings. The occasional presence of immature cells of other types in the circulation has been attributed by

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TABLE I—BLOOD COUNTS IN CASE 1

Date.	Hb. (%).	R.B.C. (mill.).	C.I.	W.B.C.	Polymorphs (%).	Lymphocytes (%).	Total lymphocytes.	Monocytes (%).	Eosinophils* (%).	L/P ratio.	—
1936. Nov. 2nd	25	1·5	0·8	3,000	8	91	2,730	1	—	11·37	Marked anisocytosis and polychromasia; 4 normoblasts per 200 white cells.
„ 4th	30	2·2	0·7	3,200	43	55	1,760	2	—	1·28	Slight anisocytosis and polychromasia: 6 myelocytes and 1 Türck cell per 200 W.B.C.
„ 7th	36	2·3	0·78	2,600	25	74	1,924	1	—	2·9	Reticulocytes 2·4%; nucleated red cells 1/100; van den Bergh, direct neg., indirect 0·15 unit.
„ 10th	60	3·5	0·85	4,000	51	48	1,920	1	—	0·94	No immature white cells seen.
„ 18th	60	3·6	0·83	—	—	—	—	—	—	—	Platelets 184,000; coagulation 1 min. 55 sec. (Dale and Laidlaw); bleeding-time 2 min. 40 sec.
„ 23rd	80	4·6	0·87	4,000	26	72	2,880	2	—	2·8	2 E. and 1 B. per 300 W.B.C.; moderate anisocytosis.
Dec. 3rd	90	4·8	0·9	11,000	34	63	6,930	3	—	1·8	1 lymphoblast, 1 Türck cell, and 1 normoblast per 200 W.B.C.
„ 16th	55	3·9	0·7	2,200	20	76	1,672	1	3	3·8	Polymorphs show a shift to the left. Slight polychromasia.
„ 22nd	45	2·6	0·86	4,000	24	74	2,960	1	1	3·08	2 normoblasts per 200 W.B.C.
„ 27th	50	2·9	0·86	3,000	20	80	2,400	—	—	4·0	—
1937. Jan. 8th	60	3·7	0·8	12,000	15	85	10,200	—	—	5·7	1 M., 1 E., 5 myelocytes, 7 normoblasts, 5 erythroblasts, 8 lymphoblasts, and 20 basket cells per 300 W.B.C.
„ 17th	55	3·3	0·8	85,000	—	—	81,600	—	—	32·0	15 P., 5 myelocytes, 2 monocytes, and 1 normoblast to 500 lymphocytes counted.

A smear taken on Jan. 23rd (four days before death) showed a picture typical of lymphatic leukæmia, lymphocytes and lymphoblasts filling the field.

Gittins to irritation of the bone-marrow by infiltration of leukæmic tissue.

Although this disease is subject to remissions, in both cases it seems that there was a definite response to treatment as for a secondary anæmia. Apparently this is not common, but it has been noted by others (Schirlitz 1930, Abt 1937), and such a response does not negative the diagnosis. In both cases red cells, neutrophils, and hæmoglobin were increased almost to normal, but in both cases the lymphocyte-polymorph ratio remained consistently above unity except on one occasion. Whitby and Britton (1937) give as a normal count for a child of this age: leucocytes, 10,000; polymorphs, 46 per cent; lymphocytes, 44 per cent.; monocytes, 7 per cent.; eosinophils, 3 per cent. Taking these figures as normal the L : P ratio is approximately unity. Both cases were well below this total lymphocyte count for almost all the course of the disease.

Case 2 differed from Case 1 in that in the former the disease process was much more progressive; the white cells gradually rose and the glands gradually enlarged—an entirely different clinical picture from Case 1. The "presystolic" murmur was of the type noted by Poynton and Lightwood (1932). Such murmurs, often in combination with pains in the extremities, may lead to the incorrect diagnosis of rheumatism. She was also more typical in having thrombocytopenia, purpura, and hæmorrhages, but the colour-index was persistently somewhat higher than is usually found.

Cooke (1933) makes the characteristics of this disease (*a*) agranulocytosis with immature neutrophils; (*b*) anæmia of aplastic type; (*c*) thrombocytopenia;

TABLE II—BLOOD COUNTS IN CASE 2

1935. Mar. 19th	25	1·18	1·09	2,400	7	93	2,232	—	—	13·29	Reticulocytes less than 0·5 per cent.; platelets 70,000.
„ 25th	25	1·26	1·0	1,800	—	—	—	—	—	—	Nearly all white cells lymphocytes.
Apr. 3rd	20	0·96	1·04	2,800	—	—	—	—	—	—	Ditto.
„ 6th	34	1·5	1·13	2,500	—	—	—	—	—	—	Ditto.
„ 11th	39	2·05	0·98	3,300	—	—	—	—	—	—	Ditto.
„ 16th	32	2·2	1·2	3,400	—	—	—	—	—	—	Count done twice.
„ 26th	70	3·5	1·0	4,200	51	48	2,016	1	—	0·94	—
May 18th	78	3·6	1·08	6,500	36	57	3,705	5	2	1·6	No abnormal R.B.C.; 1 lymphoblast seen.
June 14th	88	4·9	0·9	12,500	35	62	7,750	1	2	1·8	—
July 6th	68	3·95	0·87	165,000	3	20	160,050	—	—	32·3	Lymphoblasts 77 per cent. (all negative oxidase reaction).

* Basophils, nil.

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and (*d*) a variable number of abnormal non-granular cells. These are common findings, but often not constant, and I would like to suggest that a consistently high L : P ratio with anæmia is the commonest finding, and should be—with biopsy—the basis of diagnosis.

SUMMARY

Two cases of acute lymphatic leukæmia in children are described, illustrating certain points in the disease process. Both responded to treatment, both were truly neutropenic and anæmic for the greater part of their illness, and both had a consistent increase in lymphocyte-polymorph ratio in blood smears. Almost throughout the disease the number of circulating lymphocytes was subnormal, though the lymphopenia was never as great as the neutropenia. Only in the terminal stages were immature lymphocytes seen, when the diagnosis was obvious.

Marked anæmia plus neutropenia in a child, with a persistent increase in the L : P ratio should suggest lymphatic leukæmia whatever be the total number of lymphocytes in the blood smears.

I am indebted to Dr. Bernard Schlesinger and Dr. H. G. Close for their help and encouragement, and to Sir Frederick Menzies, Dr. H. Nockolds, and Dr. E. N. Allott for permission to publish Case 2.

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PRODUCTION OF DIABETES IN DOGS BY ANTERIOR-PITUITARY EXTRACTS

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IT has been reported by Young (1937, 1938) that a permanent diabetes may be produced in dogs by the administration of anterior-pituitary extracts. We have been able to confirm this finding* and wish to describe here in some detail the history of an animal which exhibited an intense and long-continued glycosuria.

In this dog, a male of 10·0 kg. with a normal blood-sugar at the beginning of the experiment, the diabetogenic response gradually increased from the 3rd to the 17th and last day of intraperitoneal injection of the anterior-pituitary extract made by Schockaert's method (1931) when 126 g. of glucose was excreted. After the injections ceased sugar continued to be excreted, apparently in even greater quantities than before, but as the dog was allowed exercise outside his cage up to the 30th day (the days are numbered from the time of the first injection) the values at this time do not represent those of complete 24-hour specimens.

The usual diet for depancreatised dogs of this weight (lean meat 400 g., pancreas 200 g., and dextrose 40 g.) was then given. The total daily excretion on this diet over a period of ten days averaged 85·6 g., or 11·6 g. per kg. The morning blood-sugar level was about 280 mg. per 100 c.cm., and the ketonuria was slight and variable. The glucose-tolerance curve was distinctly of the diabetic type—i.e., high and prolonged. On the 33rd day the basal metabolic rate was found by our colleague, Dr. E. Fidlar, to equal 824 calories. This is within the range of values obtained for normal or depancreatised dogs.

By the 50th day the dog had lost his usual high spirits and had become emaciated and ill. The administration of insulin produced prompt improvement and caused an increase in weight on the same diet. At the time it seemed that insulin was necessary to save the animal's life, but it is possible that a greater food intake might have been effective. Insulin caused a prompt fall in blood and urine sugar, urine volume, and ketones. With 16 units of insulin per day 11·2 g. of glucose was excreted—i.e., 1·69 units of insulin and 1·19 g. of glucose per kg. This insulin requirement is not different from that expected for a depancreatised dog on a similar diet. The diabetes continued with no signs of diminution for 58 days after ceasing the injections of anterior-pituitary extract. At this time total pancreatectomy was performed. The peritoneum and the pancreas presented a normal appearance. The operation proceeded smoothly and no remnants of pancreas were left.

After recovery from the operation the insulin requirements were again determined on the same diet. The average values were 1·62 units of insulin per kg. and 1·91 g. of glucose per kg. Subsequently, the glucose excretion varied somewhat from week to week. The amount was sometimes less and sometimes slightly more than the post operative figures given above. It therefore appears that the insulin requirements were only slightly greater after pancreatectomy than before. The animal is at present, 140 days after the operation, in excellent condition.

Both Dr. Shields Warren of Boston and Dr. W. L. Robinson of Toronto have kindly examined sections of the pancreas and agree that they show an extreme degree of hydropic degeneration of the islands of Langerhans. The beta cells are thought to show the most extensive changes. The acinar cells are well preserved. Richardson and Young (1938) have recently shown that extensive degenerative changes may be found in the islands of Langerhans in dogs which have become permanently diabetic as the result of administration of anterior-pituitary extract.

The insulin content of the pancreas was assayed by our colleague, Dr. E. T. Waters. By the method of Jephcott (1931) using white mice, it was found that the total insulin which could be extracted from the pancreas was less than 2 units, although the amount was so small that accurate assay was impossible. About 80 units of insulin can be extracted from the pancreas of normal dogs of this size when the organ is removed under similar conditions.

It therefore appears that the signs of permanent diabetes produced *in this dog* were due in large part, if not entirely, to a degeneration of the islands of Langerhans in the pancreas and a consequent deficiency in the supply of insulin. The relatively slight augmentation of the diabetic state by complete removal of the pancreas, the greatly reduced insulin content of the tissue, and the histological findings all support this interpretation. It is obvious that the results we have described do not necessarily indicate that destruction of the insulin-forming tissue is the only or even the main factor *in all instances* of permanent diabetes produced in dogs by extracts of the anterior-pituitary gland. Considered in conjunction with Richardson and Young's findings of degenerative changes in the islet cells, they do, however, focus our attention on the pancreas.

SUMMARY

A dog was given injections of anterior-pituitary extract for 17 days, during which he excreted

* Proceedings of the American Physiological Society, March, 1938.

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increasing quantities of glucose. The glycosuria continued for 58 days after cessation of injections; the glucose-tolerance curve was of diabetic type, and insulin caused a prompt fall in blood and urine sugar. The pancreas was then removed, with little effect on the insulin requirements. The islands of Langerhans showed extreme hydropic degeneration, and the insulin content of the pancreas was very low.

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THERAPEUTIC EFFECT OF VITAMIN P IN SCHÖNLEIN-HENOCH PURPURA

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VITAMIN P, which was first investigated by Szent-Györgyi and his collaborators [1 2 3 6 13] is manufactured in the pure state as citrin ($C_{28}H_{36\text{-}38}O_{17}$), a crystalline substance of the flavon group. It is found with ascorbic acid chiefly in paprikas, hips, and lemon juice, and exerts a specific regulating influence on the permeability of vessels; hence it is called the "vitamin of permeability."

In the following case of Schönlein-Henoch purpura all the characteristic symptoms were promptly influenced by treatment with this vitamin.

CASE RECORD

History.—The patient, a woman of 22, was in good health until the age of puberty, in 1929, when she began to have attacks of cramp-like abdominal pain, with nausea and vomiting, constipation, and pyrexia, for which her appendix was removed. Abdominal pain recurred, however, at intervals of a few months, and during the eight succeeding years defæcation was only possible with laxatives, and even then she sometimes went a week without a motion. She suffered considerably from morning sickness, which was aggravated by indiscretion of diet, and on several occasions had blood-stained diarrhœa.

In 1929 she also sustained an injury and thereafter constantly suffered from pain and impaired mobility of the right wrist. At times the pain increased and a swelling appeared which encircled the wrist and extended to the back of the hand and forearm. On five occasions between 1929 and 1936 she was admitted to various surgical wards with a diagnosis of tuberculous arthritis. The only abnormality visible in radiograms was rarefaction, but during these years the patient was unable to use her right hand, and was so incapacitated that she was compelled to apply for public assistance. She also suffered from periodic pain and swelling of her knees and feet, and occasionally of her left wrist, right elbow, and shoulder; but repeated X ray examinations of these joints showed nothing abnormal.

From 1929 onwards ecchymoses and petechiæ were almost constantly present though they varied in intensity at different times of the year. The eruptions had a symmetrical distribution on the limbs, and at times completely covered the legs and thighs. From 1932 she had periodic cramp-like pains with hæmaturia and albuminuria for which she was admitted to the surgical wards of various hospitals in 1934, 1935, and 1936. X ray and other examinations were negative for stone, and there was no evidence of tuberculosis. Cystoscopy showed a cystitis with ecchymoses. After 1934 this renal colic, accompanied by frank hæmaturia, became more frequent, but she passed no gravel or stone.

Also from 1929 she now and then experienced stabbing pains on inspiration, and in 1934 and 1937 she had a hæmoptysis. Although she was under observation continuously a diagnosis of tuberculosis could never be substantiated. Radiograms revealed an area of infiltration in the right lung which appeared to be a well-organised hæmatoma. In the last two or three years before her admission to hospital in 1937 she had attacks of urticaria and œdema of the face, and periods of drowsiness, in which she sometimes dozed for days on end.

Menstruation, which started when the patient was 14, was always irregular. The irregularity consisted of profuse and prolonged periods (e.g., during nearly the whole months of January and February, 1937) and long periods of amenorrhœa (e.g., from the end of February to the middle of May). Bleeding usually lasted from 2–30 days at intervals varying from 2 days to 3 months. Very often she was giddy and collapsed on the day before her periods began and had to stay in bed.

The reports on her blood at the different hospitals she attended were as follows:—

1929: Hæmoglobin, 78 per cent.; thrombocytes, 308,000; serum calcium, 10·8/10·4; serum phosphorus, 3·55/3·71.

1930: Hæmoglobin, 76 per cent.; red cells, 3,600,000; white cells, 2700; differential count, normal; thrombocytes, 270,000; bleeding-time, 3½ min.; coagulation-time, 4 min.

1931: Hæmoglobin, 86 per cent.; thrombocytes, 320,000; bleeding-time, 3½ min.

Her *condition on admission* to the Finsen Institute on June 7th, 1937, was as follows.

Right wrist.—There was no obliteration of the outline of the joint but considerable swelling round head of ulna. An ecchymosis about the size of half a crown was present on the dorsum of the wrist and had been there for more than a month. The degree of movement at the wrist was almost negligible; the joint was tender, and attempts to move it passively evoked pain. Near the *left elbow* there was a very painful bruise 3 in. in diameter. The front part of the *left leg* was covered with scattered petechiæ and the leg also showed two large, raised, tender, bluish-grey bruises. On the front of the *right leg* there were three recent very tender ecchymoses the size of halfpennies, and a fourth 3 in. across. The *ankle-joints* showed some swelling and tenderness but no limitation of mobility. Further physical examination did not reveal any points of interest.

Blood.—Wassermann and Widal reactions negative. Hæmoglobin, 88 per cent. Red cells, 4,560,000. Colour-index, 0·95. Leucocytes, 6800 (neutrophil leucocytes 78 per cent., lymphocytes 14 per cent., monocytes 8 per cent.). Platelets (thrombocytes), 200,000–400,000 (11 counts). Bleeding-time (Duke), 2½ min. (three examinations). Coagulation-time, 2–2½ min. (six examinations).

During the past eight years, therefore, this patient has presented several of the characteristic features of Schönlein-Henoch purpura, including vomiting, colic, constipation, and occasional blood-stained discharges; purpura, urticaria, and transient œdema; pain and swelling of joints; renal colic, albuminuria, and hæmaturia. Examination of the blood showed nothing exceptional; the number of platelets was normal, as were also the bleeding-time and coagulation-time, and the test of clot-retraction. But on testing the capillary resistance (C.R.) by Göthlin's method the patient showed 50 petechiæ, which denotes increased permeability of the capillaries. The same result was obtained by the method of suction,[5 7 8 9] which was used subsequently for recording the changes in the C.R. during the patient's stay in hospital.

In this method a suction cup an inch in diameter is placed on the supraclavicular region and suction

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is applied for one minute, the negative pressure being measured on a mercurial manometer. The C.R. is then taken to be the least negative pressure stated in millimetres of mercury which will produce one or two petechiæ in the centre of the area of suction. Healthy persons have a C.R. between 150 and 250 mm. Hg; readings between 100 and 150 are subnormal, and any figure below 100 is definitely pathological. This has been verified by a comparison with the Göthlin and Bexelius methods of stasis (Jersild and Elmby 1938).

EFFECT OF VITAMIN ADMINISTRATION

There is generally held to be a direct relationship between low C.R. and deficiency of vitamin C. Accordingly most diseases with low C.R. have been treated with this vitamin, and several cases of Schönlein-Henoch purpura are recorded which have been given ascorbic acid with apparent benefit (Böger and Schröder 1934). It was therefore decided in the present case to test the effect of ascorbic acid before proceeding to treatment with vitamin P, and 300 mg. of ascorbic acid was injected intravenously every day for a week. The results were negative. The C.R. remained unchanged and fresh ecchymoses appeared spontaneously. Similar findings have been recorded by Lønberg (1936).

Vitamin P was then given in the form of daily intravenous injections of 50 mg. of citrin.* The results of this are shown in Fig. 1, in which the number and extent of the ecchymoses are indicated. It will be seen from this that during treatment with citrin the C.R. rose and the ecchymoses disappeared. When the injection of citrin was stopped the C.R. fell and new ecchymoses appeared. When citrin was again given the C.R. increased again and the ecchymoses faded.

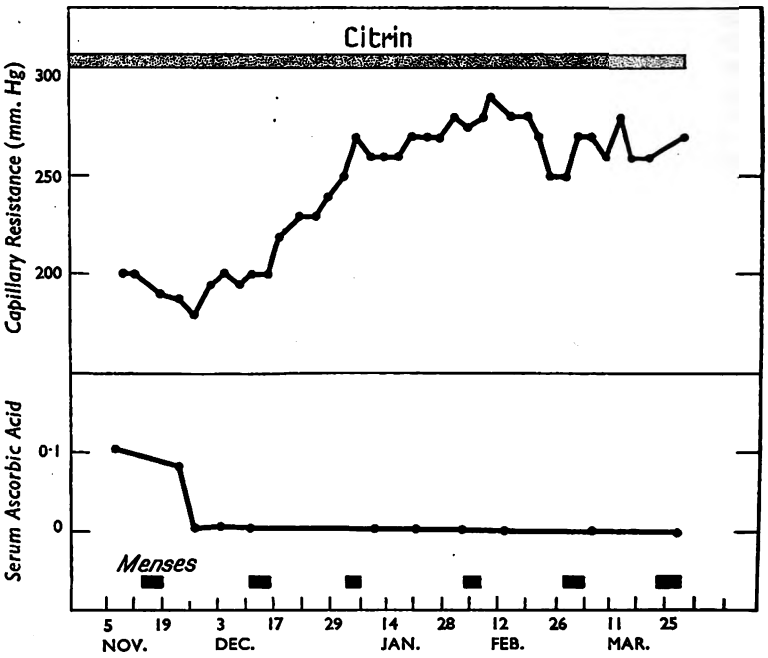

FIG. 2.—Effect of citrin (20 mg. by intramuscular injection twice a week) on capillary resistance. There is no corresponding rise in the serum ascorbic acid.

During treatment with citrin the patient lost all her symptoms of Schönlein-Henoch purpura, including the disability of the right wrist from which she had suffered for eight years. The mobility of her wrist at the time of admission was almost negligible, but two months after treatment started she was able to move it freely and without pain, and could use her hand in a normal manner. The pain and swelling of other joints also completely disappeared. The nausea ceased and the patient was able to digest ordinary food, even the coarse and fatty kind. Constipation was relieved and the bowels worked daily without laxatives. There were no further attacks of renal colic or respiratory symptoms, and it is worth noting that menstruation became regular, so that in the next five months she menstruated for 5–6 days every four weeks and there were no menstrual molimina.

The patient's food was never free from vitamin C during the first period of citrin treatment. In the next period citrin injections were continued in the same dosage (20 mg. citrin intramuscularly twice a week) but great care was now taken to ensure that the patient was given a diet absolutely devoid of vitamin C, to eliminate any effects which might be ascribed to that vitamin. This experiment lasted five months. As is shown in Fig. 2 no ascorbic acid was found in the serum from this patient for the last four months of the experiment. (The serum was tested by the methylene-blue method described by Lund and Lieck (1937).) In

* Prof. Szent-Györgyi kindly supplied the citrin for these experiments.

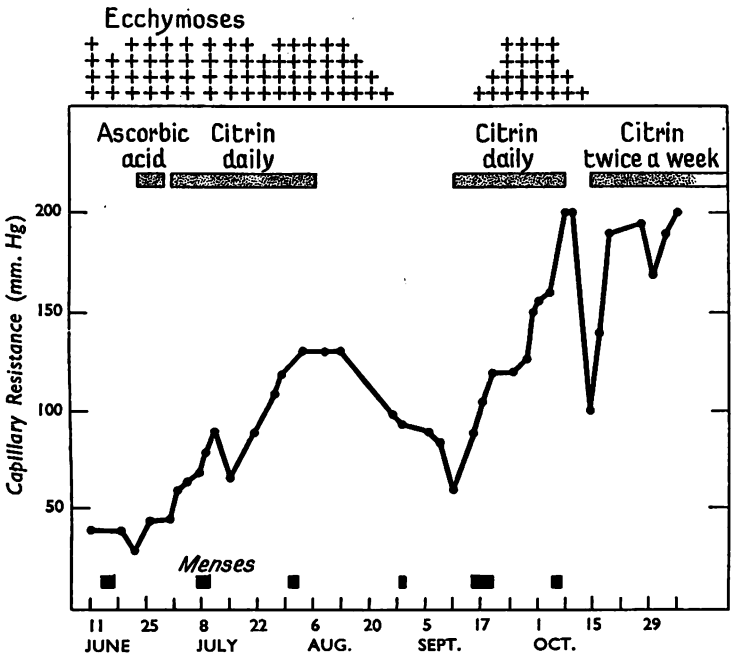

FIG. 1.—Effect of ascorbic acid (300 mg. daily) and citrin (50 mg. daily or 50 mg. twice a week) on ecchymoses and capillary resistance.

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spite of this the C.R. remained unchanged between 200 and 290 mm. of mercury (Göthlin and Bexelius tests negative) and the patient did not show any symptom of Schönlein-Henoch purpura. Neither did she show any symptom of scurvy, though it is probable that the occasional tenderness of gums and liability to catch cold which the patient developed during the last few months were a result of vitamin-C deficiency. It is possible that vitamin P has prevented the appearance of scorbutic symptoms, or perhaps deficiency of vitamin P is really the cause of those symptoms generally considered typical of scorbutic disease. Further experiments are being conducted to clarify these possibilities.

All of the symptoms characteristic of Schönlein-Henoch purpura—œdema, purpura, albuminuria, hæmaturia, melæna, colitis, and hydrarthrosis—may be explained as being the result of an abnormal capillary resistance, and this theory is supported by the observations of Müller (1922) who found dilated, elongated, and twisted capillaries in the skin of cases of Schönlein-Henoch purpura. The effect of vitamin P is to regulate the permeability of capillaries and it was undoubtedly this effect which was responsible for the good progress of the case reported here. Thus it seems that one is justified in postulating the theory that Schönlein-Henoch purpura is caused by deficiency of vitamin P.

SUMMARY

1. A woman of 22 had suffered from Schönlein-Henoch purpura for eight years, with symptoms involving her bowels, skin, joints, and urinary organs, and reduced capillary resistance.

2. Treatment with ascorbic acid for one week (2400 mg. in all) did not affect the course of the disease.

3. Injections of vitamin P (citrin) brought about the complete disappearance of all symptoms, even aborting a severe joint affection which had crippled the patient for eight years.

4. The purpura relapsed when the administration of citrin was stopped.

5. Administration of citrin kept the patient free from symptoms even when ascorbic acid had been omitted from her diet for five months.

6. It is suggested that Schönlein-Henoch purpura is caused by deficiency of vitamin P.

My acknowledgment is due to my chief, Dr. Hecht Johansen, for permission to report the case.

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MEDICAL SOCIETIES

BRITISH ORTHOPÆDIC ASSOCIATION

THE spring meeting of this association was held in London and Oxford on May 27th and 28th under the presidency of Mr. Naughton Dunn. The Association entertained as its guests a large contingent of Scandinavian orthopædists including Dr. Guildal (Denmark), Prof. Waldenstrom (Sweden), and Dr. Plato (Norway). One day was spent at the country branch of the Royal National Orthopædic Hospital at Stanmore, and the other at the Wingfield-Morris Hospital at Oxford. Clinical demonstrations of patients in varying stages of treatment and of end-results of different procedures were given at both hospitals. The material shown covered a very wide range of deformities and disease, tuberculous and non-tuberculous. Members were also shown the work in progress at occupational training centres.

During the meeting the following short papers were presented:

Mr. J. A. CHOLMELEY (London) described the Distribution and Treatment of Extra-articular Foci in Tuberculous Arthritis of the Hip-joint. He reviewed a series of 55 children treated in the country branch of the Royal National Orthopædic Hospital for tuberculous foci in the immediate neighbourhood of the hip. The most common sites were in the ilium adjoining the acetabulum and in the metaphysis of the femoral neck. In 43 patients conservative treatment had been used, and in 12 the focus had been excised. In both series the hip-joints became involved eventually in most of the cases. Less than 10 per cent. of the 55 children escaped with movable hip-joints. The conclusion was drawn that the method of attempting to excise extra-auricular foci has no advantages over conservative treatment.

Mr. M. A. MACCONAILL (Sheffield) gave an account of Structure and Function in Synovial Joints, elaborating the remarks he had made at the October meeting of the Association on the principles of joint mechanics. He outlined the relation and adaptation of joint function to the synovial fluid which lubricates the joint, and gave a detailed account of the structure and function of ligaments. He illustrated his thesis by considering several joints in detail in the light of his researches.

Dr. J. F. BRAILSFORD (Birmingham) in a paper on Osteochondritis of the Adult Tarsal Scaphoid gave details of 9 cases of this lesion affecting both feet in adult women. The characteristic lesion, he said, is an oblique splitting of the scaphoid and separation of the two fragments. The outer smaller fragment is displaced dorsally; the inner larger fragment is gradually displaced and comes to lie on the *mesial* aspects of the head of the astragalus. Later gross osteoarthritic changes develop in the mid-tarsal joint.

Mr. F. J. ALLEN (Birmingham) described an Operation to Restore Opposition of the Thumb. In 42 out of 43 patients on whom he had operated for this purpose distinct improvement in the function of the hand had resulted. The operation was applicable to both flaccid and spastic paralyses. The procedure consists in inserting a tibial graft between the index and thumb metacarpals so that the thumb is maintained at right angles to the palm.

Mr. D. LL. GRIFFITHS (Manchester) spoke on Arterial Occlusion in relation to Volkmann's Contracture. From a review of the literature and of clinical

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material, and from his experiences of embolus, he argued that the "venous obstruction" theory was no longer tenable as a cause of Volkmann's contracture and that the bulk of the evidence was in favour of arterial obstruction. He quoted 2 patients in whom, following occlusion of the femoral artery by a proven embolus, changes in every way similar to those associated with elbow and forearm fractures occurred in the calf muscles. He made a plea for more careful records of these cases—for example of the presence or absence of the radial pulse. Mr. Griffiths said that it seemed likely that the only effective treatment was operation, which should include liberal opening of the deep fascia and inspection of the brachial artery. If the artery was obstructed by spasm the best procedure to adopt was not yet certain. Periarterial sympathectomy and arterectomy had in the main been disappointing.

Mr. H. A. BRITTAIN (Norwich) submitted a preliminary account of a method of Arthrodesis for Healed Tuberculosis of the Hip. The operation he described, which was illustrated by a film, consisted in performing a short oblique subtrochanteric osteotomy, displacing the distal fragment inwards until its upper end comes into contact with the ischium over an area which is "rawed" with a special osteotome. If the hip is adducted the procedure can be carried out "blindly" through a limited antero-lateral approach. If it is abducted the classical posterior approach is employed. Mr. Brittain said that he regarded this "ischio-femoral arthrodesis" as a much sounder mechanical procedure than the usual ilio-femoral arthrodesis. In either approach the operation could be performed well away from the diseased joint. Eight patients who had been observed for at least two years since operation were reported. In all but one, who committed suicide after the removal of the plaster, the functional results were excellent and there had been no recurrence of the disease.

REVIEWS AND NOTICES OF BOOKS

Primary Carcinoma of the Lung

By EDWIN J. SIMONS, M.D., Member of the Staff, St. Gabriel's Hospital, Little Falls, Minnesota. Chicago: Year Book Publishers; London: H. K. Lewis and Co. 1937. Pp. 263. 21*s*.

CANCER of the lung is now assuming an important place in chest disease; its incidence has been estimated as 10–15 per cent. of all carcinomas. Whether it is much more common than it used to be or whether more often correctly diagnosed is still doubtful. Only those who have tried to keep pace with the work published on this disease in the last few years can appreciate the magnitude of the task involved in such a survey as is here presented. We are informed that it has been compiled by a doctor actively engaged in a country practice. The result is an achievement of which he may well be proud. All relevant advances have been not only recorded but effectively discussed without bias towards or against any particular method of diagnosis or treatment. The chapter on treatment indeed will be read with attention and profit not only by practitioners who meet such cases occasionally but by consultants with wide experience in their management.

Textbook of Gynæcology

Second edition. By WILFRED SHAW, M.D. Cantab., F.R.C.S. Eng., F.C.O.G., Physician Accoucheur with charge of Out-patients, St. Bartholomew's Hospital. London: J. and A. Churchill. 1938. Pp. 616. 18*s*.

THIS book is intended for students reading for qualifying examinations, and it will give them all they need while omitting unnecessary details. The presentation of the subject is essentially clinical and practical; the illustrations are clear and well chosen. Anatomy and physiology are emphasised as the essential basis for the understanding of gynæcological disorders, while pathology, though not discussed at such length, is adequately covered. In this edition a chapter has been added on hormone therapy and also an appendix listing the better known hormone preparations, and comparing the different units in common use. This section will appeal to practitioners, who find it difficult enough to regulate dosage without the extra complication arising from the lack of standardisation of the various preparations now on the market.

Macleod's Physiology in Modern Medicine

Eighth edition. Edited by PHILIP BARD, Professor of Physiology, Johns Hopkins University School of Medicine. London: Henry Kimpton. 1938. Pp. 1051. 36*s*.

THIS text-book has undergone a gradual change in purpose during its passage through several editions. It was originally intended to be a "guide to the clinical application of physiology and biochemistry"; it then became "a text-book of physiology for students of medicine," and later in the seventh edition announced the intention of bringing up to date those parts of the subject "for which no application may be evident." This eighth edition, the first to appear since Prof. Macleod's death, has continued the change in the same direction; applied physiology occupies a relatively small place and recent information of a strictly physiological character forms the bulk of its material. The book is now mostly rewritten by a team of American physiologists under the editorial control of Philip Bard and the authors of each major subdivision of the work are actively engaged in the study of the subject of their contribution. The participation of active specialists ensures the inclusion of accounts of modern work and modern methods, but introduces the risk of gaps on the one hand and of overlapping on the other, and the enthusiasm of the individual worker leads in places to undue stress on the problems in which he is particularly interested, and the omission of other work generally recognised as important. Clotting of blood, for example, is given 21 pages, whereas the formation and destruction of red corpuscles is dismissed in one page without any reference to the rôle of hæmopoietic factors. The vitamins receive a scanty eight pages with very few details of deficiency disorders. Although calcium metabolism is referred to, there is no clear account of the formation of bone, and phosphatase is not mentioned. Apart from omissions the individual sections vary in quality, those on the circulation and respiration being particularly full and provided with clinical applications. A very useful section is devoted to the assembly of scattered observations on the distribution and regulation of water in the body. The accounts of digestion and metabolism are adequate except for that of vitamins; the description of the nervous system is lucid and in good

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sequence, while that of the special senses is rather brief.

It is a little difficult to decide the exact type of student for whom the book is written. It cannot be used as a basic text-book of physiology because it lacks certain fundamental information; nor can it be considered solely as a book of reference for advanced students, for it retains a large mass of introductory matter. It will be of value to the senior student who wishes to make selected readings or to revive his knowledge for higher examinations, and it provides a very wide bibliography from which any reader can follow up information set out in the text. In its present form it is a volume that will find its way into the library rather than to the ordinary student's bookshelf.

Political Arithmetic

A Symposium of Population Studies. Edited by LANCELOT HOGBEN, F.R.S. London: George Allen and Unwin. 1938. Pp. 530. 30*s.*

THIS volume contains a series of studies undertaken in the department of social biology at the London School of Economics during Prof. Hogben's tenure of his post as head of the department. Various workers whose researches into population problems are well known have contributed to it, including R. R. Kuczynski, Enid Charles, and David Glass. Some of the material had previously appeared in different journals but about half is published for the first time. The first group of studies is probably the better known, dealing mainly with the present decline in fertility and its probable effects upon the size, age constitution, and, possibly, quality of our future population. In a second group attention is paid to less fully explored problems of the recruitment of social personnel—such as ability and educational opportunities in different walks of life, the relation between initial and maximum earnings, and the differential fertility of skilled and unskilled classes. On each subject much statistical matter is given and well discussed. Prof. Hogben contributes a preface in which he gives effective expression to his dislike of contemporary economics. As a whole the book is very readable and brings together material which will be of value to other workers on the problems discussed and of interest to the less specialised reader.

A Practical Treatise on Diseases of the Skin

Fifth edition. By OLIVER S. ORMSBY, M.D., Clinical Professor and Chairman of the Department of Dermatology, Rush Medical College, University of Chicago; Dermatologist to the Presbyterian and St. Anthony's Hospital. With revision of the histopathology and mycology by CLARK WYLIE FINNERUD, B.S., M.D., Assistant Clinical Professor of Dermatology at the College. London: Henry Kimpton. 1937. Pp. 1334. 52*s.* 6*d.*

THIS work, which has long been one of the best of the large text-books in the English language, has now become an encyclopædia of dermatology. Between its covers are to be found adequate descriptions of all the diseases usually included in the specialty, and on matters still controversial most of the important theories are presented. The paragraphs on treatment and pathology have been brought well up to date. Unfortunately the book has not escaped the tendency, which is the curse of dermatology to-day, to further subdivision and subclassification of disorders already well known. This process confuses the beginner and is seldom much good to anyone. In the preface the author draws attention to twenty new diseases included since the last edition appeared only two and a half years ago. Among these we find "lichen corneus hypertrophicus," which turns out to be none other than a variant of lichenification; "persistent sinus tracts of dental origin," which although not mentioned in previous editions of this work can scarcely be described as a new disease; and "sclerodermoid nevus," which is apparently the account of a solitary case. On the credit side must be placed the convenient arrangement whereby a full bibliography is placed at the foot of the pages on which the references are made. The illustrations, particularly the photomicrographs, are uniformly good and the general plan of the book is excellent.

Studies on the Physiology of the Eye

Re-issue with supplement. By J. GRANDSON BYRNE. London: H. K. Lewis and Co. 1938. Pp. 440. 40*s.*

THIS volume contains experimental studies of certain physiological phenomena of the eye. It is divided into four parts, of which the first, on paradoxical pupillary phenomena following lesions of the afferent paths, has already been published as a series of papers in the *American Journal of Physiology* between 1921 and 1929. The second part is concerned with preliminary palpebral widening, paradoxical palpebral and lens phenomena, and inherent tonus phenomena. The third part describes certain stimulation experiments, and the fourth is devoted to a discussion on inherent pupillary constrictor tonus and the mechanism of the "still reaction" in sleep, dreams, hibernation, hypnosis, narcosis, coma, and related conditions. Except for the experiments described in Chapter VII on the functions of the cervical sympathetic as manifested in its active currents, which were done in collaboration with Prof. Willem Einthoven of Leiden, the work here set out is the product of the author's own ideas and experiments. Each chapter contains a brief survey of the literature on the subject, an account of the methods used in the animal experiments performed, and the facts gleaned therefrom, followed by a discussion of their significance. A summary and the relevant bibliography is appended at the end of each chapter.

Mr. Byrne has endeavoured to show the levels or stages in the development of the ocular-effector mechanisms from the primitive type in which activation is effected by chemical means to the intermediate or chemico-neural type in which neural impulses initiated in the related centre are the effective agents, and thence to the higher level, where the mechanisms are by afferent and efferent impulses of the neuro-neural or reflex type. The widening and narrowing of the palpebral fissure and the pupil, retraction and proptosis of the eye, the changes in the curvature of the lens, and the reciprocal relations of the effector mechanisms are fully discussed. A number of animal experiments traumatising peripheral nerves, muscles, and viscera are described to illustrate that reflex palpebral and pupillary narrowing and retraction of the eye are activated from the afferent side by proprioceptive impulses of the preponderantly critical variety which pass through the parasympathetic system. Reflex palpebral and pupillary widening and proptosis are activated by

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afferent impulses of the preponderantly affective variety through the sympathetic system. The physiological phenomena in the mechanism of approach, avoidance, and standstill (still reaction), and the inception of a psychic element in these are discussed.

Whenever possible the author has drawn attention to those physiological facts which may have some clinical diagnostic significance, but the book will make most appeal to the research worker in special sense physiology. The illustrations are mainly photographs of cats, drum-tracings, and diagrams. The supplement is devoted to an account of the effect of stimulation of the cortex cerebri upon the effector mechanisms which mediate movements of the iris and membrana tympani, and there is a new index.

Heredity and Politics

By J. B. S. HALDANE, F.R.S., Weldon Professor of Biometry, University of London. London: George Allen and Unwin. 1938. Pp. 185. 7*s.* 6*d.*

THE science of heredity makes contact with politics in several ways. In this short but stimulating book Prof. Haldane discusses the doctrines which have been built up on five of these contacts. The first of the doctrines is that of the equality of man as formulated by Jefferson in the American Declaration of Independence. Though regarded by its originator as self-evident, this proposition is, in Prof. Haldane's view, supported by very little positive evidence, at any rate if we regard "equality" as meaning "similarity." In fact the converse of Jefferson's axiom has itself been built up into a doctrine by "conservative and reactionary politicians and biologists." We share Prof. Haldane's regret at the tendency of biologists to advance arguments derived from science in support of their particular political prejudices.

The other four doctrines examined in this volume are really sub-doctrines of the major one of human inequality, as formulated by these reactionary biologists and politicians. They are: (1) that the unfit should be sterilised; (2) that certain classes are congenitally superior to others; (3) that certain races are congenitally superior to others; and (4) that crossing between different races is harmful. These propositions are critically and sceptically examined. Prof. Haldane concludes of them all that the effects of a varying environment have been overlooked and that the facts do not justify any but the most tentative statements. Indeed, the doctrinal features of the statements made largely melt away when we ask what these really mean. Unequal in what respects? Unfit for what? In what sense superior? In what way harmful? In each case, there are several possible answers.

Of the five topics, the most closely related to medicine is that of voluntary sterilisation which, as the author points out, is difficult to judge without prejudice. The point of view of an involuntarily childless man is necessarily different from that of a man who has had several unwanted children; and opinions on sterilisation one way or the other show some correlation with religious and political opinions. Prof. Haldane sees in the measure, however carefully the voluntary principle may be safeguarded, a potential threat to human liberty. This argument is developed from quotations from American legal statutes and court cases rather than from an analysis of the recommendations of the English Departmental Committee on Sterilisation which reported in 1934. This committee pointed out that the obstacles in the way of the rich getting themselves sterilised were smaller than those which stand in the way of the poor. Indeed, their recommendations would perhaps widen rather than restrict the liberties of the poor. While the author gives a clear and useful account of the genetic results which might be achieved by preventing the reproduction of persons exhibiting recessive sex-linked and recessive autosomal characters he takes no account of the predicament of the woman who has already given birth to a hæmophilic son or of the parents who have produced a deaf-mute child. Such persons may have little doubt as to the direction in which they would like to have their liberties extended, especially if they are poor. A similar point of view might well be shared by mentally retarded parents, incapable of using contraceptive methods, who have had a sequence of unwanted pregnancies.

The other topics dealt with include race-crossing. Prof. Haldane argues that while it is wholly justifiable to regard the English and the negroes, for example, as members of distinct *races*, the word loses its meaning when applied to the different ethnic groups which inhabit the European Continent. The doctrine of the existence of an Aryan race is subjected to erudite and pungent criticism and here as elsewhere the need is stressed for further research.

L'exploration radiologique post-opératoire de la voie biliaire principale

By B. DEPLAS, P. MOULONGUET, et P. MALGRAS. Paris: Masson et Cie. 1938. Pp. 120. Frs.40.

IN this short monograph the authors describe their method of exploring the principal and accessory bile-ducts by injecting an opaque medium. They believe that even at operation it is often impossible to determine whether the ducts are really patent, or the nature of an obstruction should one be present, and suggest that much helpful information can be obtained by radiography. The technique which is carefully described can be applied, if required by the surgeon, from four to ten days after operation. Lipiodol or Tenebryl is used for injection or a recent American product called Hippuran. The common bile-duct and the hepatic and cystic ducts are clearly outlined. The gall-bladder, if present, is filled, so that the physiological action of the sphincters can be studied. In certain cases the contrast fluid has entered the pancreatic ducts, producing unpleasant possibly even dangerous symptoms; this accident can be avoided by making sure that the patient has fasted since the evening before the examination.

Excellent illustrations demonstrate stones in different positions in the ducts, but false filling defects which might mislead are also shown; interpretation must obviously be cautious. The local condition after operation for cholecystitis and for chronic pancreatitis can be shown on the film, lack of definition indicating inflammatory changes in the ducts. If there has been interference with the escape of bile through the sphincter, dilatation of the ducts may be pronounced. The method is said to be particularly useful in cases of biliary fistula and is recommended before any operation for repair is undertaken. It seems likely that contrast examination of the biliary passages has its uses, but it should clearly not be applied without discrimination.

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THE LANCET

LONDON: SATURDAY, JUNE 25, 1938

RESOURCES AND NEEDS

WHEN the enclosures of land, the industrial revolution, and the Napoleonic wars had played havoc with the economic state of the common people at the beginning of the nineteenth century, the poor-law system, virtually unchanged since 1601, was quite unfit to meet the situation. The Speenhamland policy of subsidising wages, no doubt humanitarian in motive, had been so exploited by employers that the labourers of nearly all England were pauperised. To remedy this state of affairs the Poor Law Amendment Act of 1834 enlarged the areas of administration and gave a central board of three commissioners wide powers for controlling the activities of boards of guardians, vestries, and parish officers. Short of interfering in any individual case for the purpose of ordering relief, the commissioners were empowered to regulate relief in detail, and they applied the axe so thoroughly that they came to be known as the three tyrants and earned the universal hatred of the poor. Their action was imperative in the circumstances of the time, but it is worthy of note that the need for it might never have arisen if the justices of Berkshire gathered at Speenhamland in May, 1795, had fixed a living wage for the county, as they originally intended, instead of creating the bad precedent of subsidising wages out of public funds.

There is some analogy between these historical events and the happenings that led to the creation of the Public Assistance Board a hundred years later. In 1934 unemployment insurance was almost bankrupt in an effort to cope with the abnormal drain on its funds from post-war unemployment and in some areas transitional benefit was dispensed with a liberality that left little inducement to workers to seek employment at the wages offered. The early efforts of the Board to bring order out of chaos caused so much indignation, not only amongst the recipients of assistance themselves, that their first regulations had to be withdrawn and the process of scaling-down spread over a fairly long period. But the Board, helped by some industrial recovery, is emerging rapidly from this atmosphere of antagonism, and its latest report [1] is a foretaste of the advantages that may come from a degree of centralised control of assistance which was denied to the commissioners of 1834. For the first time a comprehensive view can be taken of the circumstances of the able-bodied unemployed, a substantial proportion of all those in receipt of public assistance, numbering last December 581,437 (533,523 men and 47,914 women), and representing a total population in households of about 1,950,000 persons. A detailed analysis of the Board's records was made for a 5 per cent. random sample of the applicants on Dec. 3rd, and it confirms in figures the gathering impressions of observers. For instance, only 32 per cent. of the men under forty-five years have been out of employment for as short a period as a year or less, while over that age the percentage is as low as 21. Among those who have been continuously unemployed for three years or more, about two-thirds are over forty-five years of age. But there is a grave social problem of the young who have never had work as well as of the elderly who have lost it. Of the male applicants 42,940, or 8 per cent., were under twenty-five years of age.

Perhaps the most significant disclosure is the relation of the assistance dispensed to the wages that the recipients would normally earn. For males 1·3 per cent. of the allowances were equal to, or greater than, the wage-rate, and 4·9 per cent. were less than 4*s*. below it; for females the corresponding percentages were 3·5 and 10·9. It is a statutory duty of the Board to see that the assessment of an applicant's needs shall, in the absence of exceptional needs or special circumstances, be less than the amount that would ordinarily be available for the support of the household out of earnings from the occupations normally followed by its members. That there should be any cases, therefore, where this rule is not followed is an indication of the small margin by which wages may exceed needs, and often of their inadequacy to meet needs.

The following examples are illustrative:—

Applicant, aged 48, wife, and eight children of ages ranging from one to thirteen years. Rent 12*s*. 6*d*. Scale allowance 54*s*. Applicant's normal wages 38*s*. Allowance paid after full consideration of all the circumstances, 45*s*.

Applicant, aged 31, wife, and seven children of ages ranging from one to twelve years. Rent 7*s*. 9*d*. Scale allowance 48*s*. 7*d*. Applicant's normal wages 40*s*. 6*d*. Allowance paid, 43*s*.

Applicant, aged 30, wife, and six children of ages ranging from one to nine years. Rent 6*s*. Scale allowance 43*s*. 6*d*. Applicant's normal wages 40*s*. Allowance paid, 42*s*. 6*d*.

These are instances of anomalies arising from the size of family. Apart from a few exceptional employments, wages in this country have no relation to the numbers of persons who have to be supported out of them. In the view of such social scientists as Mr. SEEBOHM ROWNTREE the first requisite is to fix minimum wages on the basis of the needs of a family of a man, woman, and three children; but even then the problem of the larger family is left. For its solution this problem appears to demand a system of family allowances [2]; indeed, it is doubtful whether any other means of

[1] Report of the Unemployment Assistance Board for the year ended Dec. 31st, 1937. Cmd. 5752. H.M. Stationery Office. 1938. Pp. 197. 3*s*.

[2] *Lancet*, 1937, 1, 1411.

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adjusting earnings to needs and removing the anomalies apparent to the Public Assistance Board are possible in modern society. As Lord RUSHCLIFFE, chairman of the Board, says, these facts and considerations have far-reaching implications and raise questions of very serious social consequence going far beyond the problems which the Board alone is in a position to solve. Our new appreciation of the meaning of adequate nutrition in terms of food and wages, and the imminent decline of the population, are reasons why the relation of means to needs—for the employed as well as the unemployed—demands attention urgently.

CHEMICAL IMMUNOLOGY

THE ramifications of immunology have become so vast and complex that the medical man has some excuse for ignoring theory while adopting those prophylactic and therapeutic measures that have the immunologist's and (it is to be hoped) the statistician's sanction. When visualising the nature of immunising antigens and the antibodies whose production they stimulate in the animal body, most of us are content with the memory of the picture drawn by EHRLICH of antigens attaching themselves to "receptors" on the cell surface, and of antibodies as cell receptors set free in the serum. EHRLICH'S conception of receptors as definite chemical structures, side-chains attached to the main protoplasmic mass of the cell, did not, however, account for all the quantitative phenomena, and he was driven to the invention of hypothetical modified antigens and antibodies to explain the complexity of the systems he studied. Colloidal reactions, upon which subsequent rival hypotheses were founded, were even more difficult to grasp, and those who were brought up in EHRLICH'S doctrines may find some satisfaction in the present-day return to his basic ideas. The accumulation of knowledge of protein and surface chemistry and of crystallography has lately thrown much light not only on the chemical structure of antigens and antibodies but on the nature of the forces determining the reactions between them. Prof. MARRACK'S admirable summary of these studies, first published in 1934, has now been reissued.[1] He incorporates work done during the last four years, and emphasises in the light of fresh evidence conclusions more tentatively expressed in the first edition.[2]

Antigens containing no chemically detectable protein have been isolated from a few bacteria, but in most antigens proteins appear to be essential for the stimulation of antibodies. A simple protein presents to the tissues of an animal a surface made up of its several constituent amino-acids; in more complex antigens this surface is modified by molecular groupings other than amino-acids: carbohydrates or fatty substances either in chemical combination with, or adsorbed on to, the protein. The antibody to such an antigen is specific; complete reaction occurs only with similar antigens. Using methods introduced by LANDSTEINER the specificity of the antigen may be altered by removing or covering the existing molecular groupings, or by adding new groupings to the molecular complex. It has been shown that the antigenic peculiarity of a substance is determined not only by the nature of the active chemical groups on different parts of the whole molecule, but also by the arrangement of the individual groups. A protein modified by attaching lævotartaric acid to its surface differs antigenically from the same protein modified with dextrotartaric acid, a difference wholly dependent on a difference in the spatial configuration of atoms round a single carbon atom in each of the superimposed tartaric acid molecules. The number of spatial arrangements of a given number of units is very large, and in a simple protein it is possible to postulate a series of differing patterns of its constituent amino-acids that would confer differing antigenic specificities without alteration of the gross chemical constitution. By adding to the molecule, in different combinations, amounts, and positions, any of the non-protein molecular groups known to occur in protein complexes, the number of theoretically possible distinct antigens is immense enough to satisfy the most confirmed believer in the infinite variety of nature.

Since an antibody is by definition that which reacts specifically with an antigen, the antibody-forming mechanism of the animal body must be capable of a vast number of different specific responses. There are many natural antigens, like the snail hæmocyanins, and many synthetic antigens which are unlikely ever to penetrate the animal tissues in ordinary circumstances, so that speculations on the mechanisms of antibody formation that involve the evolution in the animal of a vast number of potential mechanisms, ready for all possible antigenic contingencies, are inadmissible. Antibodies react fully with homologous antigens, and partially with antigens that are chemically related. A study of these "cross-reactions" shows that full combination of antibody and antigen depends on the close approximation of combining sites on the antibody molecule to appropriate sites on the antigen. Not only must the antibody receptors be chemically capable of combination, but they must be arranged in a pattern that is the mirror image of the pattern of active groups on the antigen. A moderate non-conformity of pattern allows a feeble cross-reaction; a gross non-conformity prohibits combination. As in the case of antigen molecules, a large number of antibody molecules could be built up with the same constituent units and the same gross composition, and yet differ in the power to combine with antigen by reason of the spatial disposition of the units.

Antibodies appear to be molecules of modified serum globulin, and the most acceptable hypothesis of antibody formation is based on the conception of the antigen as a temporary scaffolding introduced into the globulin-synthesising cells. The free amino-acids destined to be built into serum globulin combine with, or are adsorbed on

[1] The Chemistry of Antigens and Antibodies. J. R. Marrack. *Spec. Rep. Ser. med. Res. Coun., Lond.* No. 230. H.M. Stationery Office. 1938. Pp. 194. 3s.

[2] See *Lancet*, 1934, 1, 406.

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to, appropriate active groups on the antigenic surface, and are held in a pattern determined by the antigen while they are incorporated into the globulin molecule. The surface of the globulin molecule will thus contain patterns of active groups exactly adapted for combination with the antigen, and upon the peculiarity of this adaptation depends the specificity of the antibody. This hypothesis, which postulates a general complex of metabolic processes responding uniquely to the chemical configuration of the stimulating substance, has its parallel in current hypotheses of enzyme action. The exact nature of the bond between combined antigen and antibody is not yet clear. Chemical combination involves a sharing of electrons between atoms, while adsorption occurs between molecules or molecular groups of different electric charge, and depends on the exactness of the fit of one molecular pattern with another. It is customary to think of the chemical combination as fast and specific, but adsorption may also be highly selective, as the formation of pure crystals in mixed solutions testifies, and in large molecules the adsorptive bonds may be less easily broken than the interatomic valency bonds. It is probable that antigen and antibody combine as the result of adsorption. The mechanism of the consequences of this combination is less clear. The explanation of precipitation and agglutination advanced by Prof. MARRACK in 1934, which was later put forward in a slightly different form by American serologists, is that antigen particles are specifically bound into a "lattice" with the antibody particles, and although direct proof is difficult to obtain, most of the newer relevant facts add indirect support to this view.

The attack on the problems of immunity to toxins and infections gains vastly in precision from the chemical understanding of the serum reactions. The old hierarchy of different kinds of antibody, precipitins, opsonins, bacteriolysins, and the like has given way to the conception of the serum reactions as consequences of the combination of antigen with one kind of antibody. This unitarian hypothesis, first put forward by H. R. DEAN in 1916,[3] is firmly established as far as in-vitro reactions are concerned, and in the light of the work of the last few years it is reasonable to suppose that the protective antibody in the animal body will exhibit the same general properties.

In appraisement of pioneers in science it is sometimes difficult to avoid a too generous estimate of their achievements. It is true, as TOPLEY and WILSON put it, that their views may have acquired "their main significance from knowledge gathered by later generations rather than from their inherent fertility."[4] There is, however, little need for caution in appraising EHRLICH'S contribution to medical science. Prof. MARRACK'S work provides at once a tribute to the inherent fertility of his ideas, and a demonstration of the extent to which the recent developments of immunology have confirmed his views.

[3] *Brit. med. J.* 1916, 2, 749.

[4] Principles of Bacteriology and Immunity, London, 1936.

REFRESHING COURSES

SINCE the Ministry of Health offered to pay expenses out of national health insurance funds the demand from insurance practitioners for places in refresher courses has, we understand, greatly exceeded expectation. This year twenty courses are being organised in London by the British Postgraduate Medical School, and an equal number are divided among provincial centres; between 20 and 24 practitioners are admitted to each course.

The programmes are usually designed to cover as much of medicine, surgery, and gynæcology as is possible in a fortnight. Obstetrics and pædiatrics, not being part of the duties of a panel practitioner, cannot properly be paid for from national health insurance funds. This limitation has naturally been criticised, since it is obvious that good midwifery and adequate treatment of the ailments of childhood must reduce the sickness-rate of insured persons. The Ministry has wisely allowed the inclusion of instruction on disorders of adolescence caused by diseases in childhood, and has evidently not interpreted the rule about obstetrics very strictly. Some aspects of gynæcology, antenatal work, and the toxæmias of pregnancy form part of most of the courses as directly within the scope of panel practice.

The London courses generally provide also for medical sessions on heart disease, including high blood pressure; respiratory diseases, including tuberculosis; common skin and nervous diseases; rheumatism; dyspepsia; the anæmias; albuminuria; diabetes; diet in health and disease; and psychiatry. Surgical sessions in London are mostly concerned with the treatment of fractures; acute abdominal emergencies; diseases of the breast; injuries and infections of the hand; and hæmorrhoids and varicose veins, with some account of such conditions of the eye and ear, nose and throat as are met with in general practice. Useful subjects taken at random from the programmes of recent provincial courses are enlargements of the thyroid and of the prostate and such common complaints as backache and painful feet (Cambridge); peripheral vascular disease and vulvovaginal abnormalities (Sheffield); diagnostic radiology, occipito-posterior positions, and the diagnosis of deafness (Bristol); head injuries, routine radiology and radiological treatment (Oxford); and anæsthesia in general practice and lesions of muscle tendons and ligaments (Nottingham). Birmingham has perhaps attempted too much in providing 56 lectures or demonstrations each of fifty minutes' duration in one fortnight. Though the individual items of the programme are admirably chosen—we notice especially abortion, thyrotoxicosis, malignant growths of the lung, and the causes of œdema of the eyelids among the topics—one can imagine the conscientious practitioner carrying away impressions little more lasting than those he would get from a non-stop revue.

The wide differences in basic knowledge, interests, and sphere of practice among the audiences make this type of teaching very exacting. One doctor has no interest in fractures because he sends them all to hospital. Another is irritated by being told to send a difficult case to hospital and not worry about details of treatment, because he is himself on the staff of a cottage hospital and has to deal with the case when it arrives there. Many would be glad to learn to do their own blood counts,

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transfusions, and blood sedimentation tests; others are outraged by the idea that they should add laboratory work to their already overfilled day. Practitioners as a whole tend to be intolerant of attempts to interest them in academic pathology or even medicine, or in the diagnosis or treatment of rare diseases. Some with whom we have discussed the courses take the attitude that procedures such as the insulin-shock treatment of schizophrenia or operations like partial gastrectomy or colporrhaphy do not concern them since they must necessarily be left to specialists. It is the practitioner, however, who has to recommend a line of treatment or a consultant for a particular purpose, and it is of great importance that he should have first-hand knowledge of what his advice may lead to. Teachers should, of course, discuss principles rather than details and should realise that descriptions of the minutiæ of their own pet operations are very unlikely to persuade an audience of bored practitioners of their peculiar value. It may be possible later to offer different kinds of courses, appealing to practitioners conscious of particular needs. Meanwhile the solution of some of these difficulties lies rather in the skilful handling of topics than in their choice, and must depend largely on the time that can be given to the preparation of lectures or demonstrations. The honorarium offered (three or four guineas in London) is often absurdly small in relation to the work involved, and most of the teachers must undertake such work largely from a sense of duty. Yet three or four guineas is all that the centres can afford out of the five guineas allowed them by the Ministry in respect of each attendant at the course—an allowance that seems inadequate in comparison with the subsidy payable to the practitioner himself, which may easily amount to some thirty guineas; for he is entitled to travelling expenses, board and lodging, and if he is single-handed the cost of a locum tenens. It is satisfactory to learn, however, that many teachers not only enjoy the contacts made—and perhaps profit indirectly from them—but express satisfaction in finding audiences so keen and appreciative.

The longer any centre has been engaged in providing these courses the more it tends towards clinical teaching and the less to set lectures. This is no doubt in response to experience of the greater interest shown in informal sessions. The demonstration of patients, particularly out-patients, seems to appeal to the practitioner as presenting problems like those of his own daily work. Whether more is learned from the demonstration of a few cases than from more fundamental teaching is questionable, and the problem of deciding whether to give the audience what it wants or what experienced teachers think would be best for it is likely to continue to trouble those who arrange courses. But it must be remembered that refreshment implies more than teaching practitioners about advances made since they qualified; it should also stimulate their interest in medicine as a whole. This is indeed the most important function of these courses. Little of what is learnt in a crowded fortnight is likely to be permanently retained in the adult mind. But the doctor whose enthusiasm has been effectively rekindled may well, to the great benefit of himself as well as of his patients, be led to revive habits of regular reading and attendance at medical meetings which the rush and monotony of routine work had nearly killed.

ANTERIOR-PITUITARY HORMONES

A PRONOUNCEMENT on anterior-pituitary hormones by Prof. J. B. COLLIP is always of interest, and his Cameron prize lecture, delivered at Edinburgh last week and reported on p. 1469, has fully realised expectations. COLLIP and his colleagues in Montreal have lately discovered a specific metabolism-stimulating hormone in the pituitary gland, which can increase metabolism in the absence of the thyroid and adrenal glands. When an extract containing the principle is heated to boiling at *p*H 10 and then dialysed, the activity is found in the dialysate. The dialysate also contains a substance which induces a ketonæmia in rats, a substance which prevents both insulin hypoglycæmia and adrenaline hyperglycæmia, and the pituitary melanophore-expanding principle. COLLIP suggests that one principle is responsible for all these effects, and that this is probably formed in the pars intermedia of the pituitary. Although some may feel that the evidence at present available does not permit a definite conclusion to be drawn as to whether or not one principle is responsible for all these different effects, everyone will agree that COLLIP and his collaborators have made an important advance in a difficult field by demonstrating that under particular conditions active pituitary extracts may be obtained by processes involving boiling, and dialysis through a collodion membrane. Substances that can be treated thus are probably less complex chemically than insulin and other protein-hormones. The possibility that substances hitherto believed to be secreted by the anterior lobe may actually arise in the pars intermedia is an interesting and important one, and the results of further work in Prof. COLLIP'S laboratory on this and cognate subjects will be eagerly awaited.

Mrs. Eugen Schlesinger has offered to the London County Council a freehold site of 2¼ acres and a suitable building for use as a convalescent home for ailing children at Russell's Water, Oxfordshire, a village about 550 ft. up on the Chiltern Hills, seven miles from Henley. She stipulates that it shall be used by children of all denominations, whatever the political situation of the country. The Council has no residential open-air school accommodation suitable for the 1700 children in its day-schools who are certified as physically defective because of heart condition, and has therefore suggested that the school should be built to accommodate 20 children and contain schoolroom, hobbies-room, dormitories, and staff accommodation. The estimated annual cost of maintenance will be just over £2000 and it will be borne by the Council.

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ANNOTATIONS

"STORIES TOLD IN 1937"

EVEN for those of us whom Fate is for the moment using kindly, these stories make grim reading. They relate the misfortunes of medical families in which age or sickness has brought disaster and in which the efforts of old or ill men and their wives and daughters have failed to prevent poverty. Such poverty—often the result of sheer ill luck—is all the worse when it comes as a new experience late in life, and the only tolerable feature of these contemporary records is that in these particular cases the situation has been saved by a small grant from the Royal Medical Benevolent Fund. In reading the records the mind insistently demands a happy ending; but the Fund can only do as much as the profession enables it to do, and the happy ending—or otherwise—depends on our reaction, individually and as a body, to the appeals it issues. The response is growing in volume, and the gap between what is necessary and what is possible is not so great as it was a few years ago. Despite a big increase in the number of applicants, the grants made are not so meagre as they were, and the report for 1937, now issued, shows a subscription income of £14,479. Unfortunately, however, this is still not nearly enough, and since there are over 42,000 registered medical practitioners in England, Scotland, and Wales the Fund evidently has far to go before securing what it very properly asks—namely, some support, however small, from every member of the medical profession in this country. To subscribers Sir D'Arcy Power, the treasurer, is sending from 11, Chandos-street, London, W.1, a letter outlining the situation and enclosing a brief account of cases relieved. The first thought of all who consider it will be "I must do more (or I must do something) to help this work." The occasion is one on which first thoughts are best.

OBSERVATIONS ON VENOUS PRESSURE

So far from being passive tubes, it is now believed that the veins play an active part in the circulation of the blood, under the control of chemical and nervous stimuli. Observations on some of the factors concerned are recorded by Doupe, Krynauw, and Snodgrass.[1] Measurements were made by the direct method on the median basilic, long saphenous (at the ankle), and jugular veins in normal subjects. It is shown that with the subject lying, sitting, or standing the venous pressure is rather greater than that of a column of blood as high as the vertical distance between the point tested and the highest point that the blood must reach, plus the pressure in the right auricle where the vein enters. Pressures in the basilic vein below atmospheric pressure were not observed when the arm was raised, and the minimum pressure with the arm above the level of the thorax was 1–3 cm. water. Forced inspiration, leading to negative intra-auricular pressure, does not produce a negative pressure in the veins and hence there is no suction effect. Quiet respiration had only a slight influence on venous pressure. These various observations indicate that the pressure at which blood enters the veins from the capillaries is sufficient to return blood to the heart without the aid of respiration or muscular contractions. Peripheral vasoconstriction led to a slight fall in venous pressure, but with vasodilatation it was unchanged though the vein increased in calibre. Increase in pressure in an isolated segment of vein on application of cold to the body was also demonstrated. These reactions are believed to depend, at least in part, on a nervous mechanism through sympathetic "venomotor" fibres.

[1] Doupe, J., Krynauw, R. A., and Snodgrass, S. R., *J. Physiol.* 1938, 92, 383.

THE NATURE OF NUCLEAR INCLUSION BODIES

THERE is abundant evidence that the inclusion bodies appearing in the cytoplasm of cells as the result of virus infection are aggregates of virus particles embedded in a homogeneous matrix. This emerged clearly from the experiments of Woodruff and Goodpasture[1 2] with the inclusion bodies of fowl-pox (the Bollinger bodies), and observations on the cytoplasmic inclusions of ectromelia, vaccinia, psittacosis, molluscum contagiosum, and inclusion conjunctivitis have revealed that these also are virus colonies. It is recognised, of course, that multiplication of virus in the cytoplasm of a cell does not necessarily produce an inclusion. The virus particles may be more or less dispersed throughout the cell cytoplasm, or when collected together in a compact mass may not appear as a typical inclusion because of the absence or scarcity of inclusion material. But this does not invalidate the conclusion that the typical acidophil inclusion is a colony of virus.

The nature of the nuclear inclusions that are a feature of many virus infections has also been the subject of much work and speculation. By analogy one would have expected that they too would be virus colonies, and there is nothing inherently impossible in this idea, for it is known from the work of Pinkerton and Hass[3] that some rickettsias when growing in tissue culture show a predilection for the interior of the nucleus, multiplying there and producing compact intranuclear colonies. But the opinion that the nuclear inclusions are different from the cytoplasmic ones has been steadily growing, and weight has been given to it by the claim of a number of workers[4 5] to have produced nuclear inclusions experimentally by means other than infection with a virus.

A paper by Nicolau and Kopciowska[6] puts rather a different complexion on the matter. These workers studied principally the nuclear inclusions caused by the virus of herpes, employing for this purpose a special staining technique applied to the thinnest of sections of tissues of infected animals. It should be recalled that this virus is large enough to be seen with the microscope: this was clearly indicated by the centrifuge experiments of Bedson[7] ten years ago, and though his conclusion was not generally accepted at that time it has been fully substantiated by subsequent investigations, so that it is now recognised that herpes virus is between 100 and 200 mμ in diameter. Nicolau and Kopciowska report that in sections of the brain of rabbits dying of herpetic encephalitis they have been able to demonstrate masses of granules in the nuclei of affected neurones and glial cells, which they consider to be virus colonies. The elements composing these intranuclear masses

[1] Woodruff, C. E., and Goodpasture, E. W., *Amer. J. Path.* 1929, 5, 1.
[2] Woodruff and Goodpasture, *Ibid*, 1930, 6, 713.
[3] Pinkerton, H., and Hass, G. M., *J. exp. Med.* 1932, 56, 151.
[4] Cowdry, E. V., *Arch. Path.* 1934, 18, 527.
[5] Olitsky, P. K., and Harford, C. G., *Amer. J. Path.* 1937, 13, 729.
[6] Nicolau, S., and Kopciowska, L., *Ann. Inst. Pasteur*, 1938, 60, 401.
[7] Bedson, S. P., *Brit. J. exp. Path.* 1927, 8, 470.

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appear to be bacillary rather than coccal in form, measuring approximately 0·1–0·2 μ by 0·3–0·5 μ. Similar granular masses were occasionally seen in the cytoplasm of nerve and glial cells and more rarely in the endothelial cells of capillaries and the mononuclear cells infiltrating the meninges and brain tissue, from which it would seem that the virus multiplied both in cytoplasm and nucleoplasm, though more commonly in the latter medium. According to these investigators, the typical acidophil inclusions represent a later stage of the infection arising in virus colonies as the result of agglutination and fusion of virus particles—a degenerative process in fact—and they go so far as to say that the presence of homogeneous acidophil inclusions in a cell is a sign that the cell is resisting the infection satisfactorily. Whether or not one agrees with Nicolau and Kopciowska in this interpretation of the fully formed inclusion, and probably many would dispute it, they have certainly brought forward strong evidence that herpes virus forms colonies in the nuclei and more rarely in the cytoplasm of the cells which it infects. While awaiting confirmation of this work we can congratulate our French colleagues on a most interesting paper.

ONCHOCERCIASIS IN BOTH HEMISPHERES

INVESTIGATIONS were undertaken by Prof. Richard P. Strong and his colleagues in 1934 into tropical diseases in remote parts of the Belgian Congo, and their report on this research, so far as it concerns onchocerciasis, has now been published.[1] In 1926–27 Strong visited Liberia and the Belgian Congo, and between these two African expeditions his work covered onchocerciasis in Central America.

The first part of the monograph compares the disease as found in the two hemispheres. Although onchocerciasis as a blinding disease was first generally appreciated in America—indeed it was essentially for that reason that the late Prof. F. Fülleborn raised the American parasite to specific rank as *Onchocerca cæcutiens*—the amount of blindness produced by *O. volvulus* among Bantus and Pigmies in the part of Africa lying between 5° and 6° South latitude and 23° and 24° East longitude is far more tragic even than in Central America. In the region where the expedition settled, every inhabitant they examined—and they examined all but a few—had the infection; and at the clinics there were led to them daily several hundred blind persons who waited with patience in the sun until their time came to be examined. Moreover the degree of individual infection was great; for whereas in America and other parts of Africa it was unusual to find 5 or 6 nodules in any person, in Kassende 25 to 100 were not uncommonly demonstrated. In Guatemala the incidence of infection among those simulium flies which transmit the infection was never more than 5 per cent., but in this African area it was 33 per cent. The blindness is caused by microfilariæ getting into the eye; they are, at least commonly, born within the nodules in which the host's reticulo-endothelial tissue has imprisoned their parents; their numbers lessen in a piece of snipped-off skin as the distance of its site from nodules increases; and in persons who have become blind there are nearly always nodules on or close to the head. Strong is unconvinced, however, that the nodule signifies the spot where the simulium fed and the infective larvæ entered the man; he points out that nodules are found particularly where lymphatics converge, or where there is pressure, or where bone is prominent—his inference perhaps being that in these spots an infective larva wandering in the subcutaneous tissue meets an obstruction and settles down. In America it has been amply shown that removal of nodules is a valuable method of lessening the amount of infection in localities where the simulium has a limited range and where the infection is correspondingly circumscribed. In Africa, with heavy fly infection and no such circumscription, it is felt that the first step in prevention must be one of sanitary engineering; and its necessary extent is sufficiently indicated by the fact that these simulium flies have twice invaded Kampala in Uganda, though their nearest breeding places are believed to be 45 miles away. It is thought likely, too, that antelope can act as a host alternative to man, and that there may be onchocerciasis without the tissue reaction in the host which produces nodules. In the monograph under review the ocular conditions are ably dealt with by Dr. Jean Hissette of the Congo Government Service, whose conclusions are that the ultimate cause of onchocercal blindness is atrophy of the optic nerve and that much more elaborate examinations will have to be made before we have a true picture of the various pathological changes involved. J. K. Sandground deals in the main with the systematic position of this and allied parasites and reaches the conclusion that locally the parasite depends entirely on human beings for its maintenance and spread. J. C. Bequaert thinks that the twenty known species of simulium in the Belgian Congo are only a fraction of those that inhabit that vast and varied territory.

These writers make clear how much more investigation is needed. There seems little doubt however that understanding will be inadequate so long as this important problem is treated as something apart, and is not linked with the results of research into other filarial infections and the host reactions to them. Such comparisons can hardly fail to afford mutual enlightenment.

[1] Onchocerciasis in Africa and Central America. By Richard P. Strong, Jean Hissette, Jack H. Sandground, and Joseph C. Bequaert, *Amer. J. trop. Med.* 1938, 18, No. 1, Suppl.

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IMPROVEMENT in anæsthetics and the ways of giving them has created a more personal relationship between patient and anæsthetist. As Dr. H. B. Wilson [1] regretfully observes, however, in hospitals the two parties seldom become acquainted until they meet in the operating theatre, a situation that need not arise in private practice. The effect on the patient of a personal assurance from the anæsthetist that all will be well is very valuable, and such an assurance should constitute an essential part of every "prepare for operation." The increased use of sedatives, hypnotics, and basal narcotics are other measures that contribute to the patient's peace of mind and make the operation less of an ordeal. Where surgical shock is likely to follow operation, Dr. Wilson advocates the prophylactic injection of intravenous glucose and insulin, as recommended by Fisher, and he condemns once more the starving and purging which, though less common than formerly, are still too often a part of hospital and nursing-home routine. Starvation, coupled with anxiety, causes metabolic disturbance in nervous patients; drastic purgatives

[1] In *St. Thomas's Hospital Reports.* Edited by Prof. O. L. V. S. de Wesselow, Mr. C. Max Page, assisted by Mr. N. R. Barrett, Dr. J. St. C. Elkington, and Dr. A. J. Wrigley. Second Series. Vol. II. St. Thomas's Hospital, London. 1937. Pp. 271.

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interfere with sleep, lower vitality, and not only irritate the mucosa of the intestine but may leave it distended with gas, to the embarrassment of the surgeon. Enemata, also, are dreaded by many and should not be used except in rectal cases. Severe psychic trauma may follow the administration of anæsthetics to children, and hence it is preferable that, when anæsthesia is necessary, the child should know nothing about it; which can usually be achieved with paraldehyde or Nembutal. Another of Dr. Wilson's useful points of detail is that pre-operative atropine may be given to children by mouth instead of hypodermically.

A PIONEER OF SOCIAL MEDICINE

THE rarity of a *Festschrift* in the English language enhances the honour implicit in such a tribute[1] to one of America's most important men of medicine, on his sixty-fifth birthday, from friends and students. Dr. Richard C. Cabot praises Dr. Pratt's scientific energy and enthusiasm, and the attached bibliography of his writing, impressive both in its size and in the variety of the subjects which it covers, shows that this is no partial estimate. Dr. Cabot tells how Dr. Pratt combined his interests as a scientist and a humanist throughout his life by keeping his mornings free for investigation and teaching, and insisting that the other half of his day should be spent with patients. From the human side of his interests arose the "class method" of treating tuberculosis, patients being collected into groups and given instruction on the way to manage their lives under the handicap imposed by their disease. This scheme was developed by Cabot at the Massachusetts General Hospital into a social service system of a kind now adopted in medical centres throughout the world. As the years passed, Pratt's interest widened and deepened; two of his most recent and productive contributions have been the development of the class method for the treatment of psychoneuroses, and the institution of a broad programme for the development of rural medicine. His renown is reflected in the seventy-nine articles contributed to this volume by eminent medical men of the United States, England, and Germany. It would be impossible for any physician to open the book without finding something to excite his interest. The subjects range from a study of the effects of treatment for radium poisoning on radium and calcium metabolism to the public health aspect of heart disease, from an essay on Samuel Jones Gee and his friends to an account of the Minneapolis giant who appeared in one of Harold Lloyd's films. Dr. Paul D. White discusses five cases which show the importance of cardiac neurosis, and Dr. Canby Robinson contributes an essay on the relation of emotional strain to illness. Sir Arthur Hurst recalls that the chief lesson which he learnt from "Jo Pratt" was the importance of following up the treatment of a patient's immediate ills with advice as to how he should modify his way of living so as to remain well without interfering with his ability to earn his living; and Hurst shows here how the lesson can be applied to the treatment of alcoholic gastritis.

If this volume is regarded as a recognition of Dr. Pratt's signal service to scientific medicine, the debt which the practice of medicine owes to his influence is also to be acknowledged, in tangible form, by the construction at Boston of the Joseph Hersey Pratt Diagnostic Hospital. This hospital is to be a central unit in a scheme for the improvement of facilities for the advancement of rural medicine. Dr. Pratt added materially by his thought and work to this scheme, which is designed to widen the scope of medicine in country districts and of post-graduate instruction in New England. It is based on the idea that continuity of post-graduate instruction might be provided for by a closer contact between the practitioner and the hospitals, and by the provision of young doctors who can act as locum tenents for the practitioner and thereby gain experience of the actual type of practice in which they themselves hope soon to be engaged. The conditions in New England are not unlike those at home and the progress of this scheme should be watched at a time when our own plans for post-graduate instruction on a large scale are still in their infancy.

[1] Anniversary Volume. Scientific Contributions in Honor of Joseph Hersey Pratt on his Sixty-fifth Birthday. Lancaster Pa.: Lancaster Press. 1937. Pp. 983.

MERALGIA PARÆSTHETICA

THIS name is given to a presumably inflammatory affection of the lateral femoral cutaneous nerve which produces peculiar sensory disturbances in its area of distribution, the front and outer part of the thigh. The symptoms are pain, numbness, or tingling, accompanied by local anæsthesia or sometimes extreme hyperæsthesia, with tenderness below the anterior superior spine where the nerve pierces the fascia lata. The condition is comparatively rare but Ecker and Woltman[1] have collected 150 cases from the records of the Mayo Clinic and state that its incidence there is about a thirtieth of the incidence of sciatica. Most of these cases were in obese middle-aged men; in women it is usually associated with pregnancy. Although the condition sometimes accompanied toxic states Ecker and Woltman emphasise the importance in its causation of local pressure on the nerve, as by a belt or corset, and they suggest that alterations in posture, due perhaps to obesity, may produce undue tension in the deep fascia of the thigh and thus a form of traumatic neuritis where the nerve passes through it. In treatment any possible source of pressure should obviously be corrected, but in most of the Mayo Clinic cases the pain disappeared spontaneously without any special treatment. In a few obstinate cases part of the affected nerve was resected and this was often successful in relieving the pain.

THE RED CROSS

THE sixteenth International Red Cross conference, which was to have met in Madrid, is being held in London this week, for the first time for 31 years. Although the conference has for its consideration the more familiar activities of the national Red Cross societies, the principal topic pervading the whole conference is of course the prevention and relief of suffering caused by aerial warfare. In his opening speech the Duke of Gloucester, who is chairman of the British Red Cross, pointed out that although the international Red Cross conventions have come to assure to sick and wounded soldiers in wartime, and to prisoners of war, a degree of protection which a century ago might have seemed unattainable, modern methods of warfare have created a new category of sufferers. Mr. Norman Davis of the United States, chairman of the League of Red Cross Societies, carried the suggestion a stage further, urging the conference to consider ways and means for prohibiting or restricting the bombing of open towns and cities and the establishment of zones of immunity in which

[1] Ecker, A. D., and Woltman, H. W., *J. Amer. med. Ass.* May 14th, 1938, p. 1650.

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women and children might find sanctuary. Already the agenda includes discussion of a plan for the creation of neutralised hospital areas ("villes sanitaires"). It is hoped that by revision of the Geneva convention, warfare by land, sea, and air will be covered by one code of laws. The function of the Red Cross in time of civil war is also to be discussed.

But unfortunately there is at present a disproportion between the aims and ideals of the Red Cross and the means at its disposal in staff and material. In the past there were reserves accumulated during the war of 1914–18, but now the scope of relief is greater than ever and the response to appeal far short of requirements. It is an underlying principle of the international committee that the work of its members should be voluntary and disinterested, and the choice of its members is limited by its neutrality. A larger paid secretariat is becoming necessary and it becomes increasingly hard to find members who are not compelled to earn their own living. In a brilliant speech Prof. Max Huber, president of the International Red Cross, drew attention to these difficulties, which are limiting factors of the society's activity. The response to appeals has been fitful, coming often from only a few national societies and falling off sharply after the first stages. Prof. Huber regarded the work in Spain as the most important performed by the Red Cross since the late war; but only 34 out of 60 societies had contributed to the relief and 4 of them had contributed 80 per cent. of the million Swiss francs expended in all. If the work of the International Red Cross is to be comparable to its aspirations, some regular income and possibly Government support will have to be forthcoming.

THE ENFORCEMENT OF BETTER CONDITIONS FOR FACTORY WORKERS

THE Factories Act, 1937, which will come into force on July 1st, contains many new provisions designed to secure safer and healthier working conditions. The old distinction between factory and workshop is abolished; the term "factory" is now extended to cover certain processes other than making—e.g., cleaning, washing, and demolition of articles. The Act is specifically applied also to certain premises where persons are employed in manual labour though not directly for trade or gain. The standard for overcrowding has been raised from 250 to 400 cubic feet per person, and a minimum temperature of 60° F. must in future be maintained for workrooms in which sedentary work is carried on. An important new provision (S. 11) empowers the Secretary of State to require medical supervision in factories where cases of illness have occurred, or are liable to arise from the conditions of work, or where young persons are exposed to a health risk. The removal of dust and fume is required where these are likely to be injurious or offensive to the workers, or where any substantial quantity of dust of any kind is given off. Exhaust gases from engines must be kept out of the workroom. The hours of employment of women and young persons and their holidays are regulated, and certain van-boys and errand-boys employed mainly outside the factory will also come under protection. A 48-hour week, with a 44-hour week after June, 1939, will be the maximum allowed for those under 16, though certain overtime for women and young persons of 16 and over will not be illegal. The conditions of employment of those under 16 will be subject to certain changes; certificates of fitness will be required for more kinds of employment, and provision will be made for re-examinations and for supplying the examining surgeon with information about the medical history of employees from the records of the education authorities. Young persons are to be protected from employment involving lifting heavy weights likely to cause injury. Certain welfare provisions, formerly made by special order for limited classes of factories, now apply to all factories in the new sense of the word. These include the supply of drinking water, washing facilities, accommodation for clothing not worn during working hours, seats for women and girls, and appliances for first aid.

The new Act is the outcome of a review of experience gained in the administration of the Act of 1901, of knowledge acquired by investigation and research, and of discussion with representatives of employers and workers. It shows obvious signs of compromise between opposing interests. But though its critics complain with justification that opportunities have been missed and loopholes have been left for unscrupulous employers, it certainly marks progress and should secure some reduction in the toll of accidents and sickness and some degree of improvement in the conditions offered to workers in factories.

RESPONSIBILITIES OF WOMEN DOCTORS

Dame Barrie Lambert distributed the prizes to the students of the London (R.F.H.) School of Medicine for Women on Wednesday, June 15th. Seldom does the guest of honour on this annual occasion reveal such intimate knowledge of the opportunities open to entrants to the profession. Dame Barrie graduated from the school in 1906, when resident posts open to women were still scarce. Now, as she pointed out, such experience is easily obtainable by the newly qualified; and indeed those in the audience concerned with the management of small or special hospitals staffed by women could have added useful testimony to a demand for house physicians and surgeons greater than the supply. The impetus given to the employment of women doctors by the Local Government Act, 1929, was emphasised by Dame Barrie; in London alone the number holding appointments in the hospitals taken over by the L.C.C. from the poor-law guardians had, she said, risen from 27 to 81; and, moreover, 70 full- and part-time medical women are at the present time employed in the public health and school medical services under the Council. Although women doctors are now well established, said Dame Barrie, there is still everywhere a tendency to generalise from individual inefficiency. The fact that Dr. Jones is not doing his work well is not held to reflect on men doctors as a whole; but bad work by any woman leads almost inevitably to the comment that women doctors are no good. Much depended on the success or failure of the first woman to be employed in any job. More than 40 years ago the L.C.C. appointed to the medical staff of a mental hospital a woman who, after seven years' work, had a mental breakdown. The unjustifiable conclusion was drawn that women were unlikely to be able to stand the strain of such work and it was not until 1927 that this ban was raised and two women were appointed. This time they were a success (though one ended her career in the service by marrying the medical superintendent) and 14 medical women are now employed in this service. Dame Barrie concluded a stimulating address by permitting herself a generalisation with which few will quarrel—that success in medical practice depends almost as much on an understanding personality as on professional skill.

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SPECIAL ARTICLES

MEDICAL AND PUBLIC HEALTH SERVICES IN CANADA

THEIR RECENT EXTENSION AND FUTURE*

BY F. W. JACKSON, M.D., D.P.H.

DEPUTY MINISTER, DEPARTMENT OF HEALTH AND PUBLIC WELFARE, PROVINCE OF MANITOBA

THE provision of public health services in Canada has made big advances during the last few years. Every province now has a fairly well organised department of health, and the Department of Pensions and National Health, at Ottawa, under the capable leadership of Dr. R. E. Wodehouse, has been entirely reconstructed and will now be to us in the provinces what the United States Public Health Service is to the individual States.

The question of adequate medical care for our population has been of great concern for some considerable time, not only to official bodies, or to the individuals requiring such care, but also to Organised Medicine, and in 1934 the committee on economics of the Canadian Medical Association presented to the annual meeting an exhaustive report on health insurance, setting forth those conditions which must be taken into consideration before the State could intervene in the provision of medical care in Canada. As long ago as 1920, however, in many of the rural areas of Manitoba and Saskatchewan, the public had itself set up schemes to provide the necessary medical care in their communities. The plan is what is called the "municipal doctor system." As the name implies, this means the engaging of a physician by the municipality on a salary basis, to give the residents of the municipality medical care.

A municipality in Western Canada is the local unit of government and is an area consisting of 200–300 square miles with a population varying from 1200 to 3000. This particular type of service has extended until we now find over one-fifth of all the rural municipalities in Saskatchewan have their medical services supplied in this way, and approximately one-fifth more have either voted favourably on the scheme or are at present operating under a similar plan. In Manitoba there are nine municipal corporations receiving medical care under the municipal doctor plan, and probably three or four more will come under the scheme during this present year. Two other municipalities are paying physicians out of municipal funds for the services they render to municipal residents on the basis of a "fee for services rendered," using a special schedule of fees for this purpose.

As one might expect, the greatest agitation for State provision or supervision of medical care has taken place in the western provinces of the Dominion, where in many localities and municipalities proper medical attention is not available, owing to the low income level of the residents and their distance from a physician. This has resulted in the passing of health insurance Acts in Alberta and British Columbia. The Act in Alberta, passed in 1934, setting forth in detail just how a province-wide scheme should be inaugurated, has not as yet been put into operation. In British Columbia all the necessary machinery was set up to bring their Act into operation last year, but owing to the opposition of Organised Medicine it was found impossible to establish the health insurance scheme. This opposition was due chiefly to the decision of the Government not to include indigents in the scheme. At the last general election, which took place in the summer of 1937, a plebiscite on the question revealed that the public were overwhelmingly in favour of health insurance, but until the present time the Government has not seen fit to bow to the mandate of its people. I think we are safe in saying that all Organised Medicine in Canada is seized with the necessity of some remodelling of the present system of medical practice in order that those with low incomes and those who are indigent may receive the adequate medical service which is available to both the very poor and the well-to-do.

MEDICAL SERVICES FOR THE UNEMPLOYED

With the advent of the depression consideration had to be given to the medical care of the unemployed, and this has progressed so far that we can assume the unemployed in Canada, as a whole, now receive a fairly adequate type of medical service. From a provincial standpoint this is probably best organised in Ontario, where the provincial government pays over to the medical profession a certain definite amount per head per month for unemployed persons and the medical profession, in return, sees that this group in the population receives the care it requires. The sum paid varies from 35 to 50 cents per head per month, which, after deductions for drugs and administration, leaves 28 cents for medical care. Although this does not give the physicians satisfactory remuneration, it does at least make sure that they are not out-of-pocket in providing the service. The Ontario Medical Association divided the province into eleven districts, corresponding to the districts of the local medical societies. The physicians in the different districts form a local committee to supervise the service, and the money for the medical care of unemployed persons in their district is turned over to this committee for distribution. All the physicians who have rendered service to the unemployed send in an account at the end of each month, using the regular schedule of fees, and the physicians' committee pro-rate the total amount available, depending upon the work done by each physician. This sum actually paid appears to work out at about 40 per cent. of the account submitted under the regular schedule of fees. The services provided are a general practitioner's services; specialist and consultation services are paid for at a rate 50 per cent. higher than general practitioners' fees and allowance is made for mileage where this applies.

"In Essex County, Ontario, the program of medical relief was viewed as an opportunity to accomplish two purposes: first, for the Medical Profession to administer medical relief in a satisfactory manner, and, second, for the Profession to gain vital data and experience. In the relief program are specific answers to many questions of medical relations, administration and costs. The answers to these questions apply equally well to medical relief or medical care for the lower income groups of the population. It was with these views that the Essex County Medical Society embraced the opportunity to apply a scientific technique in the solution of a social and economic problem."

The consultant for this experiment is the well-known American, Nathan Sinai, D.P.H. It is understood,

* Address delivered at the Conference of State and Provincial Health Authorities of North America, held at Washington, D.C., from April 9th to 11th, 1938.

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also, that the international health division of the Rockefeller Foundation has made a contribution for administration expenses.

In the Western provinces most of the unemployed are congregated in the cities and the provision of medical care for them is generally considered to be the responsibility of the local governing body. Several varieties of arrangement have been made with the profession for supplying the service. In many instances the city pays to the profession a lump sum monthly, for which the profession provide the unemployed with any service they may require. The money thus received is usually pro-rated by a committee of the local medical association to the physicians who have provided medical care for the unemployed.

In Winnipeg, Manitoba, in 1933, the profession decided that some arrangements would have to be made for the providing of medical care to the unemployed, since up to that time this group had been carried by the profession as charity cases. After nearly a year of negotiations with the city, an arrangement was entered into, which set up a system of medical services to the unemployed, under medical control, with a special schedule of fees of approximately one-third to one-half the rates usually charged. This service supplies everything that might be required by the unemployed person, including drugs and some dentistry. The individual needing the service has a choice of physicians and, excepting in case of emergency, is required to get authority from the medical relief officer to call his doctor. In case of emergency he may call his physician and obtain the authority afterwards. The physician, on taking over a case has to notify the medical relief officer, and this notification is on a special form which gives information in reference to the type of the illness as well as to the amount of medical care such illness may require. The service is not claimed to be a complete one, for it is only supposed to take care of acute and subacute conditions. However, it has developed until practically everything from which the unemployed person may be suffering is looked after by the profession at the expense of the city. The service is under complete medical control through a medical advisory committee who have authority to settle all disputes which may arise in connexion with the service. This committee consists of the city medical officer of health, the city relief medical officer, the chairman of the committee on sociology of the Manitoba Medical Association, and one other member of the Association. This service has extended until now practically every municipality in Manitoba gives to its unemployed the same type of medical care, under the same plan—payment being made, on a fee basis, to the physician for all work done under the special schedule of fees. Wherever this service has been established, through the efforts of the Manitoba Medical Association, a deduction of 5 per cent. is made from all doctors' accounts and paid into the funds of the Association. As might be expected, this is providing quite a substantial sum of money which is held in a trust fund, to be used if, and when, consideration is given to some province-wide form of State medicine or health insurance. The information obtained from the returns of the physicians under the plan in operation in Winnipeg has been tabulated from year to year, and we are now obtaining a collection of statistics which will be of real value in estimating, for an urban community, the amount and type of illness and its requirements in terms of medical care (Tables I–V).

TABLE I—COMPARATIVE SUMMARY OF MEDICAL SERVICES TO PATIENTS ON RELIEF

	March 1st, 1934, to Feb. 28th, 1935.	March 1st, 1935, to Feb. 29th, 1936.
	Total for year.	
Calls:		
House	15,987	19,721
Office	22,265	26,667
Hospital	8,065	7,889
Operations:		
Major	519	581
Minor	920	1,204
T. and A.	727	628
Fractures	33	178
Maternity:		
Hospital	702	728
House	137	145
Sundries:		
Special examinations	243	292
X rays	193	246
Anæsthetics	234	425
Dental	1	—
Consultations	266	376
Radium—rental	—	14
" treatment	—	9

TABLE II—GENERAL DISEASE GROUPS

	Per cent. of total illnesses.		Per cent. of total illnesses.
Respiratory	24·6	Genito-urinary (non-venereal)	4·3
Epidemic, endemic, and infectious	5·9	Confinements and abortions	6·2
General	2·6	Puerperal and menstrual	3·4
Nervous system	3·7	Skin	7·0
Eye and adnexa	1·6	Bones and organs of locomotion	2·9
Ear and mastoid process	4·4	Accidents and external causes	7·5
Heart and circulatory system	5·3	Other	1·0
Digestive	14·1		
Teeth and gums	0·9		
Kidneys and adnexa	2·6		

THE MUNICIPAL DOCTOR IN ACTION

To go back to the "municipal doctor system" of providing medical services, this would appear to have a definite place in any State provision or supervision of medical care, especially in certain types of communities such as the rural areas of most of the western provinces, and I expect in most of the western States. The plan is now well stabilised in Manitoba in that we have adequate legislation to control it and this control rests directly where it belongs—i.e., with the provincial department of health and public welfare.

TABLE III—PRINCIPAL CAUSES OF ILLNESS

	Cases per 1000 persons
Digestive system	61·5
Tonsillitis and sore-throat	52·7
Respiratory diseases	52·5
Diseases of skin	30·7
Confinements and other puerperal conditions	29·7
Accidents and other external causes	28·9
Heart and other circulatory diseases	22·8
Disease of nervous system	19·5
Non-venereal diseases of genito-urinary system	18·4
Lumbago, arthritis, and rheumatism	16·9
Measles	16·5
Diseases of ear and mastoid process	13·0
Diseases of kidney and adnexa	10·7
Diseases of eyes	6·0
Pneumonia	5·9
Diphtheria, scarlet fever, and typhoid	3·4
Tuberculosis, all forms	2·1

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The control is exercised over the formation, size, and population of the proposed municipal doctor's area, the doctor's salary, and the terms of his contract. A standard contract, which remains in force for the duration of the Municipal Doctor By-law, is now in operation and makes certain provisions which we think are essential if the public and the practitioner are to receive proper consideration. It sets out in detail the duties of the doctor, which are to provide a general practitioner service, to do minor surgery, to act as health officer, and to carry out in his district the duties imposed by the Public Health Act. The contract also makes provision for leave for the physician each year with pay and an extended leave every second year with pay in order that he may go for short post-graduate courses. Provision is also made for permission to attend all district and provincial medical association meetings without loss of salary. In this way we hope to keep up to date those physicians who find this type of work attractive.

The salary the physician receives is decided by consideration of the size of his district and the number of individuals contained therein, and varies from $3000 to $4000 per year. There are certain perquisites attached to this. Many municipalities allow the physician to make a nominal charge for the first call in any given case—the sum usually being $2. The doctor may do emergency work outside his area and make a charge therefor. He may charge for work done for non-residents within the area who may require his services. He may also charge a reasonable fee for any medicine or dressings he provides for the patient. Taking all these into consideration, the average yearly income of a municipal doctor will be in the approximate neighbourhood of $4500. Out of this he has to pay all expenses in connexion with his practice, such as telephone, office, and travelling, which would possibly amount to from $800 to $1000 a year. In order that the doctor may not be at the mercy of a lay governing body, provision is made in the contract that he cannot be discharged without three months' notice, and if he is of the opinion he is being discharged without cause, he has a right to appeal to an advisory board consisting of three members—one representing Organised Medicine, one representing the Department of Health and Public Welfare, and one representing the municipality. The decision of this board is final and binding on all parties.

We believe that a gradual extension of this type of service in selected sections of rural Manitoba, and as a matter of fact in all Western Canada, will go a long way towards providing at least an adequate general practitioner service for our rural residents. From the standpoint of the taxpayer the service is very reasonable, for it is given at an average cost of from $2 to $2·50 per person per year. It has the additional advantage that it reduces to the minimum what might be called unnecessary hospitalisation; or, in other words, the flocking of persons into hospitals where they know they will get their hospitalisation and medical attention without cost to themselves. We have found, over a period of five years, that the per-capita cost to the municipal corporations with municipal doctors for the hospitalisation of indigent patients is only about half what it is in municipalities where the medical services are supplied in the ordinary manner.

From a public health standpoint a municipal physician makes an ideal health officer, because he finds it to his advantage to use to the fullest extent those methods now available for the prevention of disease. In these municipalities there is complete immunisation against diphtheria and small-pox and, in most of these areas, also against scarlet and typhoid fevers. Dr. R. O. Davison, deputy minister of public health for the province of Saskatchewan, in a paper given at Vancouver in 1936, pointed out that if the whole profession in Saskatchewan had immunised, during 1935, as thoroughly in their practices as had the municipal doctors in their districts, approximately three times as many persons would have been immunised against diphtheria, small-pox, and scarlet fever as actually were immunised. In other words, the financial consideration of private practice resulted in only one-third of the desired immunisation in Saskatchewan being carried out during 1935.

The municipal doctor usually provides a fairly adequate school medical service. Prenatal care of expectant mothers is well looked after. There being no financial barrier between the mother and the physician she seeks advice and any medical care she may require during the prenatal period as well as at confinement. As a result maternal deaths in these districts have been negligible during the past four or five years. The maternal death-rate in the areas organised since 1934 is 1·8 per 1000 live births as compared to the provincial figure of 4·3. Another interesting figure is the crude death-rate, the average

TABLE IV—MEDICAL SERVICE TO UNEMPLOYED IN CITY OF WINNIPEG (1935–37)

1. *Average number on relief* 30,531
2. *Number of illnesses:*
   Total yearly average illnesses 22,131
   Average illness per person per year .. .. 0·73
3. *Days of hospitalisation* (1935 and 1937 only):
   Average per person .. .. 1·14
4. *Death-rate per 1000 population* (1936 and 1937 only):

Age-groups 1–60.	Specific death-rates of relief population.	Specific death-rate for city of Winnipeg.
adjusted rate ..	2·47	3·10

Note.—In considering "death-rate" we deleted age 0–1, as we understand that no deaths of infants in hospitals following maternity cases were credited as *relief* deaths. Relief rate in this age-group was only half of the Winnipeg rate. It must be remembered also that the relief groups are not exposed to industrial hazards.

TABLE V—MATERNITY SERVICES TO UNEMPLOYED IN CITY OF WINNIPEG (1935–37)

1. *Average Number of Pregnancies per Annum*

Pregnancies.	Hospital.	Home.	Total.	Per cent. abortions.
Full term ..	583	60	643	26·4
Abortions ..	71	99	170	—
Total ..	..	..	813	20·9

2. *Birth-rate per 1000 Population*

Relief .. .. 20·2 | City .. .. 12·4

3. *Maternal Mortality* (1936 and 1937 only)

	RELIEF.			CITY OF WINNIPEG.		
—	Live births.	Deaths.	Rate.	Live births.	Deaths.	Rate.
Average ..	618	1·5	2·25	2733	15·5	5·65

Note.—All abortions received medical care and were thus reported. Percentage of abortions is new in statistics and may give us some idea of the abortion situation.

Maternal mortality.—It must be remembered that all maternity cases probably received adequate prenatal care and that no surgical interference was allowed without a consultation.

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for the last three years being: municipal doctor districts 7·74; whole province 8·43.

THE FUTURE

Taking into consideration all the medical services now being provided through the auspices of the State, one is safe in saying that from one-fifth to one-quarter of the total population of Manitoba actually are receiving medical care under some form of State medicine or health insurance. What the future holds, remains to be seen; but one fact is apparent—namely, that as yet we have not the required information in Canada to allow us to set up, with any degree of actuarial accuracy, a scheme in all its details of adequate medical care for all groups in our population. More information must be obtained as to the amount and types of illnesses amongst the various groups in the different sections of Canada and it would seem unwise for the Dominion, or any province, to embark on a wholesale scheme for the provision of medical care until this information is available. The information now being made available through medical care to the unemployed in several parts of Canada, and the data being collected amongst certain industrial groups, may give us a fair picture of the problem for our urban population; but, in so far as the west is concerned, there are no reliable data in connexion with illness amongst the rural people.

With the assistance of the Rockefeller Foundation and the Department of Pensions and National Health, Ottawa, the Department of Health and Public Welfare of Manitoba is going to conduct a study this year in those areas employing a municipal physician to ascertain the types and amount of sickness amongst our rural people as well as the requirements for a complete medical service. This survey should provide the added information we require to estimate fairly accurately the probable cost of a province-wide scheme of medical care if and when the public demands it.

MEDICINE AND THE LAW

Undue Influence by Alleged Medical Practitioner

A CHAUFFEUR who had described himself as a doctor of medicine was the subject of startling allegations in a probate action (Barclay's Bank and Pullen *v.* Vince) tried by Mr. Justice Bucknill last week. Had his name been on the Medical Register, the accusations would no doubt have been examined from the point of view of professional discipline. The testatrix, Mrs. Pullen, aged 69, suffered from serious disease of the heart and, without being intemperate, was by no means a teetotaller. She had lived for 32 years with her husband, and in 1936 she made a will leaving him the bulk of her property. Her estate consisted mainly of funds which her husband had provided. A few months after the date of this will, Vince became employed by Mr. and Mrs. Pullen. He was said to have quickly obtained a marked ascendancy over Mrs. Pullen, to have persuaded her to make a voyage with him to Australia although she had always hitherto exhibited a strong dislike to entering a boat of any kind, and to have induced her to destroy the will previously made in favour of her husband. On Jan. 1st, 1937, when the vessel was in the Red Sea and the heat was intense, Mrs. Pullen became gravely ill. She died next day of acute pneumonia and cardiac failure, but not before she had signed a fresh will written in the handwriting of Vince and leaving him the sum of £3500. Barclay's Bank and the husband, as plaintiffs, asked the court to declare in favour of the will of 1936. They contended that the making of the second will on Mrs. Pullen's death-bed was procured by the fraud and undue influence of Vince. Their counsel bluntly said that Vince had pandered to Mrs. Pullen's vanity and love of drink and had gone as near to committing the crime of constructive murder as any man could without being tried in the courts of this country. Vince put in a defence and he counterclaimed that the court should declare in favour of the will of Jan. 2nd, 1937; but he failed to file an affidavit of documents and in consequence the court ordered his defence and his counterclaim to be struck out. He did not appear in the proceedings. The judge seems to have been satisfied that the allegations were sufficiently substantiated. Vince, he said, had acquired a sinister influence over this poor old woman who had disease of the heart and who had been warned by her doctor that she must not take too much alcohol. Mr. Justice Bucknill strongly suspected that Vince gave her too much to drink, knowing, with the medical knowledge which he apparently possessed, that it was the worst possible thing for her, and knowing that it might have a fatal effect upon a woman in her condition travelling through great heat. The judge held that the will of Jan. 2nd, 1937, had been procured by undue influence and he pronounced in favour of the earlier will of 1936. Counsel's statement had indicated that Vince, when staying at hotels, had given himself the description of doctor of medicine in signing the register, and that, while he was in the employ of the Pullens, letters were addressed to him as "M.D." It is indeed a qualification which can be assumed with ease and often with impunity.

Osteopath and Diabetes

In another case last week, this time in the criminal courts, a defendant admitted two convictions for having used the initials "M.D." after his name. Yet these former prosecutions had not deterred him from giving grossly ignorant advice in medical matters with fatal results. Miss Beryl Young, aged 23, a school teacher at Cheltenham, was found to be suffering from diabetes at the age of 19, and was treated at the Cheltenham General Hospital. She was subsequently attended by Dr. W. H. Pedlow of Cheltenham and was placed on a careful diet and treated with injections of insulin. A friend of the patient advised her to see Herbert Jones, who was described as an osteopath and radiologist. According to the prosecution, Jones sounded the patient's heart with a stethoscope, pulled down her eyelids, and then told her mother that Beryl Young was not suffering, and never had suffered, from diabetes. She was suffering, he said, from anæmia, which might become pernicious anæmia; she must starve herself and take orange juice three or four times a day. The poor girl ran out joyfully to her father, who was waiting in the car outside, and said "I have good news for you, daddy; I have not got diabetes and I never had." The family returned to Cheltenham and the inevitable happened. Beryl Young became very ill. Her father telephoned to Jones about her loss of weight and her dislike of the orange juice. The reply was "splendid; tell her to grit her teeth and continue the treatment till she sees me on Thursday." By the Thursday the patient was in a state of diabetic coma. Dr. Pedlow's assistant was called in and she was taken to the Cheltenham

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Hospital where she died a week after having been given this grossly ignorant advice. Medical witnesses told the court that she would have been alive to-day if she had continued the special diet and insulin injections. The defendant in his evidence said that, when the patient visited him, he found no external symptoms of diabetes; he meant to carry out tests on the next occasion. He prescribed a four days' fast with copious drinks of hot water to clear the system; he gave light treatment by electric lamp, and told her to take orange juice. In cross-examination he said that he had no experience of diabetes and had never had a case of it through his hands. Mr. Justice Charles put the obvious question "When the mother asked you whether the girl had diabetes or not, why did you not say 'I have no experience of the disease' instead of saying she was not suffering from it?" The defendant made no reply. Jones was found guilty and was sentenced to six months' imprisonment in the second division. The judge observed that, but for the accused's good character the court would have felt bound to impose imprisonment for a long term, not only to correct him, but also to deter others who might be likely to undertake the treatment of sick folk. This leniency was no doubt entirely proper, though we must resist any tendency to conclude that an osteopath treating diabetes is, like a dog not previously known to be dangerous, entitled to one bite. No more apt instance can be imagined, however, of the wicked recklessness of the unqualified practitioner who takes easy advantage of the reluctance of a patient to continue an inconvenient but necessary treatment. Gloucester, it seems, is not one of those cities which have secured by Local Act the restriction of electrical treatment to practitioners who are properly qualified.

PANEL AND CONTRACT PRACTICE

NATIONAL INSURANCE SCHEMES IN AUSTRALIA

(FROM OUR OWN CORRESPONDENTS)

THE Commonwealth Government has sought advice in establishing social insurance on a national scale from two British officials, Sir Walter Kinnear and Mr. Godfrey Ince. Each has submitted reports outlining schemes deemed suitable for application in Australia; the former for health and pensions insurance, the latter for unemployment insurance. The two schemes follow the British model in providing for contributions by employers, workers, and the State.

HEALTH INSURANCE

The proposed scheme for health insurance closely resembles that now operating in Great Britain—a compulsory contributory scheme with equal contributions from employers and workers, supplemented by a State subsidy. In return for his contribution a worker would receive the right to medical attention and sickness payments and to pension payments for himself. The scheme is designed to cover persons earning less than £365 per annum and all manual labourers. Health insurance for dependants of workers is not recommended. It is suggested that detailed administration of the scheme, other than medical benefits, should be in the hands of approved societies. These societies would include organisations already experienced in the administration of insurance benefits, and also any "reputable body of persons" who cared to form a society. Each society would be self-governing, keeping its own set of books, but subject to periodic inspection. Persons to be insured under the scheme could choose their own society; and societies could not reject applicants solely on the grounds of age. Medical benefits would be under the direct supervision of the central department in consultation with a "medical benefits council" including representatives of insured persons, medical practitioners, chemists, local authorities, and persons appointed by the Minister. Every society would be treated as a separate insurance unit. Certain of the benefits would be statutory and available to all insured persons, others would be "additional" and contingent upon the achievement of a good sickness and administrative record by the individual societies.

It is argued in favour of the use of approved societies in a health insurance scheme that voluntary social insurance by friendly societies and trade unions has been very successful, and that it would be unfair to eliminate them. These bodies have moreover acquired long experience in the administration of health insurance, and are better fitted than a Government department to acquire an intimate knowledge of individual circumstances.

In Australia, the chief problem of administration is to cover extensive areas as cheaply and effectively as possible. The scattered nature of the population makes decentralised control essential, while considerations of cost render it necessary to simplify the agencies of government as much as possible. Benefits and contributions would need to be not less attractive than those to which the insured have been accustomed under the existing voluntary schemes. The Kinnear plan provides for health insurance for the bread-winner only, whilst friendly societies in this country are accustomed to provide medical benefits for both the bread-winner and his dependants. Any government scheme which offered less than had been obtainable under the voluntary system would be unlikely to commend itself to the Australian people.

PENSIONS INSURANCE

The pensions insurance plan requires equal weekly payments by employers and workers into a fund, subsidised by the Government, from which regular disbursements could be made to insured persons on attaining the age of 65, and to the widow or orphans of an insured man. Insured women would be entitled to a pension at the age of 60. Although a contributory pensions scheme is to be welcomed, the benefits proposed are rather low in relation to standards of living in Australia. This scheme would not involve the use of approved societies for its administration.

Australian Governments have provided a wide variety of social services, and although Great Britain, for example, spends much more per head on social services than does Australia, our expenditure is heavy and increasing. Since the inauguration of the Commonwealth Government in 1901, not only has the proportion of government expenditure on social services expanded, but the proportion of social service expenditure to the national income has increased threefold. If one takes account of expenditure from loan moneys for school building, houses, and other social services the upward movement becomes still more striking. As yet, the rate of increase of expenditure on social services does not appear likely to slacken. The recent depression

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caused a heavy rise in expenditure, and although it fell away a little for two or three years, Australian social expenditure is now at a record level.

The movement in the expenditure of pensions is worth noting. When they were instituted in 1909, the maximum pension was ten shillings per week; there were 65,500 pensioners drawing a total of one and a half million pounds (Australian currency). To-day the maximum pension is £1 per week and for the financial year 1936–37 some 300,000 old age and invalid pensioners received a total of 14 million pounds. This year payments will be larger still. The proportion of pensioners to total population will continue to grow for many years, as the decline in population growth brings a rising percentage into the pensioner age-group. Thus every year tends to place an increasing burden on the shoulders of the remaining productive members of the community. In 1935–36 Australia spent on social services about £5 16*s*. (Australian currency) per head, compared with Great Britain's expenditure of £9 sterling per head in 1934. But part of the British expenditure was paid by contributions from the insured persons themselves. It seems that if social services are to be developed in Australia, the insurance method will have to be used.

DETAILED PROPOSALS

The introduction of health insurance would provide an opportunity for planning a comprehensive scheme to promote public health. Statutory benefits already recommended are: "medical," including free medical treatment and the supply of drugs and medicines; "sickness" which is a money payment during incapacity to work through illness; and "disablement" corresponding to the present invalid pensions. In the Kinnear plan no recommendation has been made for the treatment of dependants. Local opinion, however, regards as hardly adequate a scheme which fails to pay attention to the care of women and children. There are definite advantages in the inclusion of dental and optical treatment and hospital services in the scheme as soon as is possible. Provision for consultant service and specialist treatment is also worthy of consideration, particularly for such diseases as cancer or for lung infections. On an official estimate, 1,850,000 wage-earners will be covered by the scheme, and the yearly payment to the medical profession will be more than £1,000,000. The payment offered to insurance doctors is 11*s*. a year for each insured person entitled to benefit for general practitioner services, excluding treatment for confinements, treatment covered by workmen's compensation Acts, major operations, and administration of an inhalant anæsthetic. Minor operations and treatment of fractures and dislocations are included. To meet the special difficulties of country doctors extra payments by the National Health Insurance Commission are proposed to cover both travelling expenses and time in respect of insured persons resident in country districts more than three miles from the nearest insurance doctor. The suggestion is that any legally qualified medical practitioner will be admitted to the scheme, and insured persons will have free choice of doctors from those included in the service.

MEDICAL OPPOSITION

It is realised by everyone that coöperation between the Federal Government and the medical profession is essential to the success of these plans. But there is at the moment a deadlock in the relations between the profession and the Government, because the suggested capitation fee of 11*s*. is considered too low to provide a satisfactory service. Before the introduction of the National Health and Pensions Insurance Bill, which if enacted will give effect to the scheme outlined above, the Federal Council of the British Medical Association had come to an agreement with the Government which included the acceptance of 11*s*. per annum as capitation fee for all insured persons. But although the Federal Council speaks for the Association, it cannot, as was made clear at the time, bind members by its decisions. There is a great deal of opposition on the part of practitioners to some of the provisions of the Bill, and after consulting members the Federal Council has suggested certain amendments which the Government are apparently not prepared to accept. The minimum capitation fee which would be acceptable to the profession is said to be 14*s*. in the metropolitan areas, with an additional 25 per cent. for country areas. Mileage rates are also considered inadequate, and the absence of any provision for night fees, however small, to be paid by the patient is resented. The doctors' case has been strengthened by the proposal to extend medical benefits to dependants. The argument of the Government is that 11*s*. per head is a better rate than the present lodge rate. The question remains whether the lodge service is satisfactory. The proposed national insurance fee covers a wider range of service than the lodge fee; on the other hand the insured persons would be a healthier age and sex group, and dependants are not yet definitely included. The compromise of a temporary acceptance of the 11*s*. fee, pending adjustment, is not favoured by the Government since the actuarial basis on which the scheme has been planned would be upset by any increase in this fee.

*** It is stated in the *Times* of June 21st that the National Insurance Bill giving effect to the Government proposals passed the House of Representatives on June 20th by 33 votes to 28 after debates extending over five weeks. The Prime Minister of Australia, having stated that the Bill could not be amended to placate sectional interests without destroying its actuarial basis, promised to appoint a Royal Commission to consider, among other questions, an increase of the capitation fee and the provision of medical benefits for dependants of the insured.—ED. L.

THE LANCET 100 YEARS AGO

June 23rd, 1838, *p.* 449.

From a review of a book on Bright's disease by Dr. Martin Solon of Paris.

THE following remarks on the probable issue of the affection are instructive:—

"The prognosis is unfavourable when the urine is colourless, of very low density, and contains a large share of albumen. It becomes more favourable when the urine froths less, regains its normal colour, and the albuminous precipitate presents a rosy tint. The latter appearance indicates the return of the uric acid. An increasing proportion of urea, great putrescibility of the urine, and a more abundant precipitate by oxalic acid, announcing as it does the reappearance of some of the normal salts of the fluid, augur a favourable termination." —P. 255.

It is a novel feature in the history of a disease to find its prognosis almost wholly based on chemical phenomena, and it gives a pleasing foretaste of what may be hoped from the further progress of organic chemistry. . . .

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GRAINS AND SCRUPLES

Under this heading appear week by week the unfettered thoughts of doctors in various occupations. Each contributor is responsible for the section for a month; his name can be seen later in the half-yearly index

FROM A LONDON PRACTITIONER

IV

THE Health Campaign has, in the pretty jargon of the B.B.C., "come on the air." Vox Clamantis in microphonam, the Golden Voice from Harley Street advises its invisible, unnumbered listeners to go to their doctors for an examination or overhaul with a view to staying-up or securing their health. If they are Insured Persons they have not even to pay a fee, but in any case the reassurance would be worth the money. (The Voice does not put it quite so crudely, but that is the gist of it.) There is nothing unusual in this piece of advice. The public is being urged from all quarters (except perhaps by Our Dumb Friends the G.P.s) to take their children and to go themselves for periodic overhaul to their doctors. It all sounds so innocent and easy that it is barely questioned, and yet it raises formidable problems not only for the practitioner but—if taken seriously—for the public. Now Harley Street is, like the hill of Zion, a fair place where—

> "They lie beside their nectar and the bolts are hurled
> Far below them in the valley and the clouds are lightly curled
> Round their golden houses girdled with the gleaming world,
> Where they smile in secret—"

("Golden houses" is, I think, particularly apt.)

But come down a moment.

Scene, the G.P.'s surgery or consulting-room; time, consulting hour; the sick come and go. Enter patient:—

"Doctor, I just want you to overhaul me, I shan't keep you long."

Now what does that really mean? Generally, it means that the patient is afraid of something but, with the dangerous belief in the efficacy of physical examination which is so common, does not intend to tell you his fears; but whether it is that or only the B.B.C., what does it imply?

If it means anything at all it means, to the doctor with a conscience, a rather more complete examination than for life insurance. The doctor is being asked not for a simple opinion on the probable duration of life but for a guarantee of present health—organic and functional—and for advice on its maintenance or on the treatment of any defects he may find, whether dangerous to life or not. A perfectly legitimate and interesting problem in practical medicine certainly, but three-quarters of an hour's work at least, more if anything turns up, and a burden of responsibility far heavier than most ailments lay upon us. Full notes must be made for future reference if the thing is to be worth twopence.

* * *

The first—perhaps the least—reflection on the matter is that if the High and Great ones within the profession and without mean to reiterate their advice, they should at least make it clear that the prophylactic overhaul is a major medical service. The situation which would arise if the insured population, under the influence of mass suggestion, listened to Vox Clamantis and took us at his word, may safely be left alone till it arises, but there would be a most glorious scheemozzle.

But let that pass. Grant the periodic overhaul to be practicable; grant that time is found and cash forthcoming. Is it good for the patient?

* * *

For the child, on balance, certainly; for his tissues are fresh and unscarred, and, within limits, malleable; his growth can be guided a little, and incipient departures from the line of good health can be corrected. Defects of eyesight and hearing, dental decay or crowding, postural faults, unnoticed by child or parent, may be discovered and put right. There will be a debit side of innocent tachycardia or cardiac murmurs, postural albuminurias, fidgets mistaken for chorea, uninfected but hypertrophied tonsils, impaired percussion notes at the right apex, and so forth, which had been far better undiscovered; but no one would have the hardihood to deny that regular inspection of elementary school-children has done good, and it is hard to dispute the conclusion that it might be extended to the whole child population.

The adolescent and young adult whose way of life could often be modified to advantage might benefit even more. An annual inspection from 16 to 25 would most truly make for health, but the further we get from youth and the nearer to the inevitable degenerations and scleroses, the more we enter the years of fixed habits, unalterable occupation, inescapable responsibilities, when the prison house itself has closed upon the grown man, the more doubtful becomes its value. Less and less can we answer our patients' ever more anxious and searching questions, until after middle life the thing with its load of responsibility becomes something of a nightmare.

"Have I got cancer, doctor?" "Madam, my examination reveals no evidence of it." But she may have it all the same, and in six months—let alone a year—it may have gone far.

"What about my blood pressure, doctor?" "Sir, it is rising steadily." "What shall I do about it, doctor?" "Sir, since careful investigation reveals no focus of infection, since your way of life, for one with your responsibilities, appears to me blameless, and since you feel perfectly well, nothing." "Then why—?" Why indeed? But what is the doctor to do? Shall he lie cheerfully and wait for the relentless progress of events or someone else's pressure gauge to show him up? Or shall he counsel caution and retirement, end a useful career, implant fear, turn a happy, useful citizen into an anxious invalid and, likely enough, raise the blood pressure and shorten life? Suppose in some tortuous way the issue be evaded it is only postponed, for another routine examination is due in six months or twelve. Why, oh why, could the poor chap not wait until he at least felt something wrong?

I have the strongest feeling that the wise patient over twenty-five will consult the doctor when something can be felt or seen to be amiss, and until then keep away. For one who wishes to live a happy and useful life I believe it is by far the safer course.

* * *

There still remains "above all ask him in time." True, it is horrible to be too late. Diphtheria, syphilis, the surgical emergencies, tumours, cancer

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symptoms, the soil-contaminated wound, glaucoma, pulmonary tuberculosis, diabetes, incipient streptococcal meningitis—yes, assuredly they should send for us early; and yet a sort of doubt remains. Is it not diligently put about that the wise citizen should, at the mere wind of a symptom, run to his doctor who will forthwith identify and abort the incipient malady? We are credited by implication with the power to nip not only buds but half-developed nodes, and we seem by our silence to admit the claim, though knowing well that we must, as a rule, see the bud at least half open before we can even name it, and that not one bud in twenty can be nipped at any stage of its efflorescence. We even know that it may be much wiser not to nip, and we know very well that there is no essential connexion between earliness and preventability.

Our poor patients—if the propaganda soaks in, takes root, or whatever propaganda does—are in for some bitter disappointment, and we are in not only for embarrassment but, as with the routine examinations, for very real difficulties. Confronted with declared disease, major or minor, our course is clear enough; confronted with subjective symptoms only it is not so clear, and with new unfledged ones barely out of the egg it is obscure indeed. Time is of the essence of the contract.

* * *

I discussed the matter with my friend Parsnip.

"You know," said he, "I've had a lot of symptoms in my time—I don't mean illness, that's different, but just symptoms, let me see—" And it appeared that poor Parsnip in some 25 years of manhood had had a lot of things. Fleeting pains in almost every part of the body, coming and going without apparent cause or effect, cramp in the feet and in the hamstrings, a quite severe pain in the knee after prolonged sitting persisting from the middle of the stalls to the door marked "Exit," "deadness" of fingers or of a whole arm on waking—sometimes day after day for a week, spasmodic sneezing attacks and rhinorrhœa, teichopsia (he described it in detail), stasis of the stomach with copious vomiting overtaking him in the night, mild arrhythmias of the heart, the bladder, the bowel, and the sleeping mechanism and several other things.

"But have you asked your doctor and above all asked him in time?" I said.

"Well, no," said Parsnip, "not precisely. Of course, if I've got something to show or something that sticks I do, but I like to give the thing a chance. You see, I've grown out of a lot of them. I haven't had the sickness in the night, or the wiggly things in the eyes, or the heart-bumps for years. I hardly ever get sneezing fits now, and I never get asthma (Oh, yes, I had that too once), and a holiday always cures the rest. You know I like my doctor, he's a nice chap but a bit serious, and if I go and tell him about these pains and things he'll think he ought to do something—well you can hardly blame him—and so he'll have one lot of things X rayed and take swabs and cultures of the rest, and I have a sort of hunch that when they've done with me, except for the teeth, tonsils, and bank balance, I shall be much where I am, because you know," said Parsnip, "I have a shrewd idea that I'm an average healthy man."

"You may be right," said I.

* * *

Of course that is special pleading, but what is the sober truth? Is it not this much clear? Our lords and masters seem to think that if they can first imbue the doctor with the "preventive spirit" and then induce the public to keep running to see him, the trick will be done.

The fact is that the doctor—whether at home or at a clinic, G.P. or whole-timer—is being invited to work more and more in that debatable territory where the frontiers of the normal melt into the morbid, the territory where the whole profession (and perhaps the specialist most of all) has so often and so notoriously come to grief. It seems to be thought that the doctor's job is simply to detect the early symptoms or signs—not to overlook; but in fact it is the far harder one of discriminating between signs and symptoms true and false—not to misjudge. It is not the "preventive spirit" which he needs—most of us have that—it is the highest degree of clinical skill and acumen and a power of judgment which can only be acquired by long experience, accurate observation, detachment, and humility.

* * *

If the public does what it is told it will be the doctor's duty again and again to say, "I cannot tell you. You must wait and see; come back in a month." But this is the last thing the public is warned to expect.

"Don't wait. Go at once to your doctor. He will know and he will tell you," is the tenor of the official advice both lay and professional. Not a hint that the doctor may have a difficult job, that you may not be able to get a straight answer when you ask him. The temptation to a false assumption of certainty or to the pronouncement of a premature judgment is strong anyway—it is greatly strengthened by propaganda of this kind.

We know what happens: the doctor, playing as he believes for safety—his patient's as much as his own—comes down all too often just on the morbid side of the fence, with one of those face-saving, risk-avoiding, half-hearted phrases which indefinitely postpone the difficult duty of diagnosis, but label the patient as not quite well.

* * *

At present it is the clinics, those bulwarks of preventive medicine, which are the chief offenders. They would, of course, die sooner than pronounce the words "a touch of ——" but are not a whit ashamed of "pretuberculosis states" or "potential rheumatism"—suspended diagnoses which are allowed to persist unresolved for years. Nor do they see anything illogical in applying to "potential rheumatism" the treatment suitable for rheumatic fever, but in very dilute solution. Only the Recording Angel knows the sum of child-play-hours sacrificed in the prevention (or is it treatment?) of potential, but actually non-existent carditis, but ten years must be a conservative estimate and unless there is far more on the credit side than seems at all likely it must be a black page for the Auditor to contemplate. Oh for a Captain McWhirr (of the steamship *Nan Shan*)!

The general practitioner, thinking more of his patient, less of abstract "prevention," at present sins less often—he is also much less tempted—but if driven to it can we doubt that he will follow suit? The labels he applies will be less sophisticated but their effect will be the same. The patient will be conscious of a mysterious something which marks him out from the healthy; he is "delicate," not quite well, he must take care, perhaps his heart, his lungs, his stomach, or his nerves are in some kind of danger and will give way if he lives a normal vigorous life.

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To call this kind of thing "preventive medicine" seems very surprising, and yet a case can be made out.

If our whole concern is with death and with gross organic disease, and if the citizen's expectation of life at birth is an accurate index of a country's health, well and good. We shall by these methods prolong a certain number of lives and prevent or curtail a certain amount of organic disease. But if it is health we are after, and if the index of a country's health is rather the desire and ability of its citizens to lead vigorous, useful, happy, and courageous lives—die when they may—then I believe we should think twice before we let loose on the community a "health campaign" like the present one. From the citizen it demands either biological knowledge or a high degree of enlightened common sense, from the doctor really first-class professional ability and acumen, and from both a notable capacity for courage and clear thinking. Are we sure that either party has enough of these qualities to make the thing safe? If not, had we not better let it grow naturally as it will, and apply ourselves diligently not to propaganda but to the education of all concerned, and endeavour by observation, thought, and simple practice to perfect ourselves in our exceedingly difficult art?

*** *This concludes the four articles by A London Practitioner. Next month An Aural Surgeon will be responsible for these columns.*—ED. L.

UNITED STATES OF AMERICA

(FROM OUR OWN CORRESPONDENTS)

SEPTIC SORE-THROAT TRACED TO MILK

NEAT detective work in the New York State Department of Health has just cleared up the source of an epidemic of septic sore-throat in a small village in the State. Twelve cases were reported on April 29th, 12 on April 30th, 4 on May 1st, and 3 on May 2nd. The epidemiologists soon discovered that two-thirds of these patients were employed at a single milk-collecting station and that the remainder were members of their families. The factor common to all patients was the consumption of raw milk from this plant, from which the bulk of the milk was shipped to New York City, fortunately to be pasteurised before distribution. No case of septic sore-throat is known to have been caused in the city. However, it was plainly a matter of urgency to discover the source of the streptococci incriminated. The suspected milk was received at the collecting station from 199 different farms, which had a total bovine population of about 3600. How was the responsible cow to be detected in this large and widely scattered population? A Breed smear was made from the pooled milk from each dairy farm, the specimens being taken at the plant on the morning of May 3rd. On microscopic examination the smear from one farm stood out from all others in its profusion of leucocytes and clumps of streptococci. This farm was, therefore, the first to be investigated and the milk sanitarian quickly discovered a cow with a suspicious type of mastitis. From the suspected quarter of this cow's udder hæmolytic streptococci of Group A (Lancefield's classification) were isolated. This cow had been purchased by the producer shortly before the beginning of the outbreak. His family had used none of its milk and there had been no suspicious illness on the dairy farm. Its owner had sold its milk to a pasteurising plant. The raw milk had been used only by the caretaker and his mother, both of whom had had a moderately severe sore-throat in December, 1937; hæmolytic streptococci were found in the caretaker's throat when it was examined on May 11th.

The implicated producer sold daily about 1600 pounds of milk to the collecting plant, his milk being received in the cooler shortly before 8 A.M. when the employees usually drew their milk. The outbreak demonstrated the rapidity with which the source of infection can be discovered by the coöperation of specialists, as well as the importance of pasteurisation of city milk-supplies.

PATHOLOGICAL LESIONS TRACED TO ELIXIR OF SULFANILAMIDE

About six months have now elapsed since the 76 deaths were traced to Elixir of Sulfanilamide, which contained diethylene glycol. Recently Dr. Cannon and Dr. Geiling of the University of Chicago have published further studies of the pathological effects in both animals and man of this form of poisoning. The results in animals (dogs, rats, and rabbits) were identical whether the elixir or diethylene glycol were used. When the elixir was excreted through the kidneys of these animals severe hydropic degeneration of the convoluted tubules and also occlusion of the lumens was found and animals allowed to survive developed anuria followed by acidosis and uræmia. A characteristic central hydropic degeneration within the liver was also produced by these substances. The pathological effects observed experimentally were exactly similar to those in the necropsy material obtained from the viscera of eleven human fatal cases. Pulmonary œdema, and at times bronchial pneumonia, developed in both animals and in human beings. Diffuse cortical necrosis with recent hæmorrhage was found in the kidneys of several of the human cases, also hyaline thrombosis of the smaller cortical arteries and arterioles with resulting infection of the cortex. This study suggests the need for further work on the toxicity of other compounds in this class.

THE PROPOSED NEW ARMY MEDICAL LIBRARY AND MUSEUM

A Bill has been introduced into Congress calling for an appropriation of over three million dollars for a building to replace the present Army Medical Library and Museum. The building would provide improved facilities for the custody of the books that the library now contains (more than a million volumes) and for future expansion. The museum, which is under the same roof as the library, was established in 1836 and is now the largest museum of human pathology in the United States. The present building is wholly inadequate for the purposes of these two important collections which have long proved a source of reference invaluable to those engaged in medical research, writing, or teaching.

TUBERCULOSIS AND SYPHILIS

One of the main functions of the State Charities Aid Association is to avoid overlapping between voluntary and official health organisations. At the annual conference of the association held in New York City from May 24th to 26th, Dr. Edward S. Godfrey, Jr., the State Commissioner of Health, reviewed investigations which have shown the close relation of poverty and overcrowding with tuberculosis morbidity and mortality. In half of the patients in

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State tuberculosis hospitals, he said, the invalid is the principal wage-earner of the family. In addition to the recognised public health measures for the control of disease the Government must concern itself with the general improvement of economic and hygienic conditions and with the provision of financial aid to such families as have lost through sickness the principal wage-earner.

Dr. Robert E. Plunkett estimated that at least 50,000 additional beds are necessary to meet the standard of 2 beds per tuberculosis death. He emphasised the grave danger that lies in discharging the patient whose recovery has not reached a point which may assure him of relatively good health and the possibility of economic self-support. Better facilities were needed for education, training, and rehabilitation. Rehabilitation should include: (*a*) an extension of therapeutic assistance; (*b*) continued segregation of positive-sputum cases; (*c*) more thorough conservation of the benefits of past treatment; and (*d*) improvement in the socio-economic status of both the patients and their families.

Dr. William Siegal presented a number of tables showing which age-groups yield (1) the largest number of active cases of tuberculosis, and (2) cases in the earliest stages of the disease. Examinations of children under 15 were the least productive and the most expensive. When the average cost per examination made in the New York State clinics was ascertained, it emerged that it cost $4418 to find each new case among the children, $121 for each new case among *all* patients over 15, $91 for each new case among *new* patients over 15, and only $77 for each new case among those over 45. When a choice had to be made adult contacts should thus be examined even to the exclusion of children.

Dr. William B. Brumfield, Jr., the director of the division of syphilis control of the State Health Department, discussed the rapid development of this branch of the health service, and anticipated its further extension as a result of the recent legislative provision for federal grants in aid of syphilis control work beginning at $3,000,000 per annum and rising to $25,000,000. There was a dearth of adequately trained personnel to conduct the control measures that have now become financially possible. The State of New York was undertaking the preparation of three groups of specialists: (1) full-time administrators; (2) part-time clinicians; and (3) public health nurses with special training in the conduct of syphilis clinics and the investigation of lapsed cases and of contacts. Courses were being held at Johns Hopkins University and at New York University, where twelve physicians at a time received special training with scholarships provided from funds appropriated under the Social Security Act and allocated through the State Department of Health. Short subsidised courses of post-graduate instruction for practising physicians whose expenses are refunded by the State had proved very popular. When the present series of courses were completed, some 450 physicians would have been trained. For public health nurses a six weeks' course was provided at Syracuse University. Dr. Brumfield added that it was not easy to find medical graduates with sufficient groundwork of knowledge to be trained as specialists. Better courses in syphilology were needed in the curriculum of the medical schools.

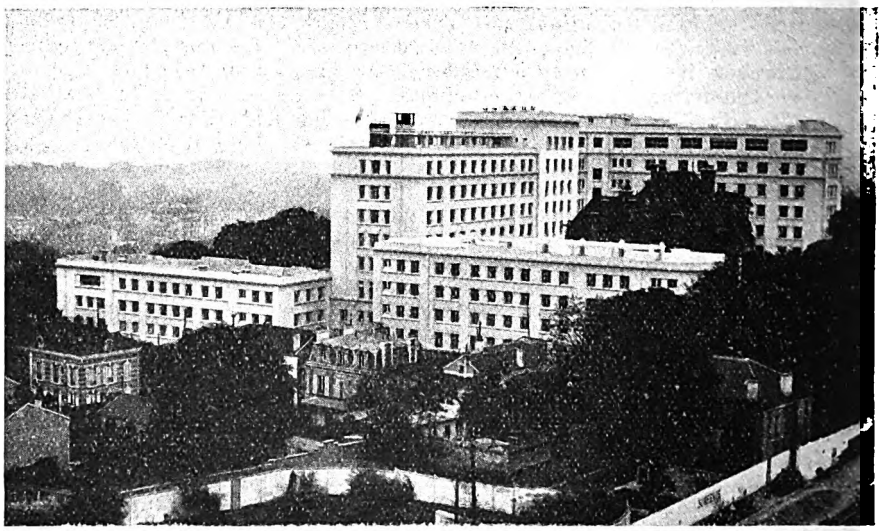
PARIS

(FROM OUR OWN CORRESPONDENT)

A NEW MIDDLE-CLASS HOSPITAL

THE Fondation Médicale du Mont Valérien, in the Parisian suburb of Suresnes, which was officially opened last year, owes its origin to the efforts of Dr. Du Bouchet, who was in charge of an American ambulance service during the late war. Soon after the war ended he began to collect funds for a hospital for middle-class patients who would not or could not enter the public hospitals, and who could not afford the high fees of the private hospitals, and with State help the money was ultimately found. The 340 private wards of the hospital are, however, still far from full, partly because the public has not yet woken to the advantages offered and partly because certain Paris doctors object to an institution which they think may conflict with their own interests. Some of this opposition has been met by improving the facilities for practitioners to follow their cases in the hospital, and a large panel of doctors has been appointed with the right to continue to treat their patients in the hospital provided they conform to a certain moderate scale of charges.

The charges of the hospital are indeed amazingly low—85 francs a day for a private ward, including the daily visit of the doctor on duty, minor dressings, and ordinary drugs and laboratory tests. Extra charges are made only for radiological examinations, complicated laboratory tests, pharmaceutical specialties, special dressings, blood transfusion, special calls on the doctor, and any operation, large or small. A charge of 2500 francs is made for a confinement, including a fortnight in a private ward, fees of doctor and midwife, prenatal consultations, and so on.



FONDATION MÉDICALE DU MONT VALÉRIEN

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A few wards have been set aside for those who are willing to pay more than the minimum fee and do not want to put themselves under too great an obligation to the institution.

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

PROF. COLLIP ON PITUITARY HORMONES

THE Cameron prize lecture was delivered before a large audience at the University of Edinburgh on June 16th by Prof. J. B. Collip, M.D., F.R.S., professor of biochemistry at McGill University, Montreal. Prof. Collip began by speaking of the known effects of removing the pituitary, and the actions of anterior-lobe extracts on normal and hypophysectomised animals. He pointed out the improbability that the three types of cells existing in the gland should secrete so many different substances having so many different actions, and suggested that some if not all of the active principles of the anterior lobe exist as prosthetic groups in a very few individual protein substances. "The process of secretion from the normal intact gland could then consist in either the liberation of massive protein molecules, each containing active groups of specific hormone nature, or the liberation of the active groups themselves from mother molecules by enzymatic or other action." He thought that the comparatively pure substances arrived at by the various methods of extraction might not exist in precisely the same form in the original gland. The active principles he divided into two types: first, there are those acting on the outlying glands and modifying their functions (e.g., the thyrotropic, gonadotropic, and adrenotropic hormones), and secondly, there are those apparently having a direct action on some general bodily function (e.g., the growth-promoting factor). He felt, however, that this last anterior-pituitary principle might exert some influence on growth via the adrenal glands, since no growth hormone has been isolated that is free from adrenotropic action. Crude extracts are more potent in growth factor than purified extracts. Anterior-pituitary growth hormone is necessary for proper growth of the body as a whole, but not necessarily for the proliferation of tissue or the growth of individual organs, since fibroblasts grow, and implanted tumours continue to proliferate, after hypophysectomy. Speaking of the thyrotropic hormone, Prof. Collip said that the active principle, extracted by differential isoelectric precipitation of protein, is destroyed by boiling at *p*H 8 but remains active after boiling at *p*H 4·5, as tested by retention of its actions in raising the metabolic rate of guinea-pigs, in increasing the weight of their thyroid glands, and in causing hyperplasia of the glands. These three methods of assay show close correlation. The bearing of the pituitary-thyroid association on clinical hyperthyroidism is by no means clear, but variations in the function of the thyroid may be the result of variations in the amount of thyrotropic hormone, or of differences in the response of the thyroid gland to other stimuli.

After discussing the isolation and methods of assay of the gonadotropic, adrenotropic, and other factors Prof. Collip described in some detail work at present in progress in his laboratory on the specific metabolism-stimulating principle. This principle, which he believes is probably formed in the pars intermedia, is separable from all other known factors except the melanophore factor. It produces after injection into rabbits a rapid and short-lived reduction in the respiratory quotient, and an increase in the metabolic rate, which are independent of the thyroid gland. The extract remains active after boiling at *p*H 10, after dialysis through fish bladder and collodion membranes, and after electro-dialysis, in which it travels to the cathode. The stimulation of metabolism can still be obtained after adrenalectomy. The same extract is found to produce ketonæmia in normal and adrenalectomised rats and to prevent insulin hypoglycæmia and adrenaline hyperglycæmia. He suggested that the melanophore, metabolism-stimulating, and ketogenic factors of the anterior pituitary, and also the factors neutralising the hypoglycæmic and hyperglycæmic effects of insulin and adrenaline respectively, may be one and the same substance.

After paying tribute to the work of his collaborators, including D. K. O'Donovan, A. H. Neufeld, and O. F. Denstedt, Prof. Collip closed his lecture with a reference to antihormone substances. He recalled that, for example, long treatment of female sheep with gonadotropic hormone makes them resistant, so that with continued injections further increase in the size of the ovaries is not obtained and indeed recession takes place. The serum of such resistant animals confers resistance to gonadotropic hormone when administered to untreated animals. However, for a short time, about 3–5 weeks after the start of hormone injections, the animals' blood shows a synergistic action with gonadotropic hormone whereby the administration of hormone and serum to another animal induces a much greater increase in the weight of the ovaries than did hormone alone.

HONORARIUMS FOR HOUSE PHYSICIANS

The Students' Representative Council are hoping to persuade the managers of the Royal Infirmary of Edinburgh to give a small salary to the resident house physicians and house surgeons. The proposal they make is that £25 should be given for six months' service in the infirmary, and one of the arguments they bring forward is that some of the best men do not become residents because they cannot afford to live in the residents' mess. This proposal is likely to be considered sympathetically. An additional reason for its support is that residents in the municipal hospitals are now paid, and as these hospitals become more highly developed the experience gained in them will be almost as good as in the Royal Infirmary.

PROFESSOR OF MEDICINE IN EDINBURGH

The appointment of Dr. L. S. P. Davidson to the chair of medicine at Edinburgh in succession to Prof. W. T. Ritchie, as announced in your news columns last week, comes as no surprise. Though the appointment is not to be a whole-time post, it is understood that the new professor intends to devote almost all his time to the work of his department. He will be connected both with the Royal Infirmary and the municipal hospitals, and an important part of his work will be the developing of teaching facilities in the latter; for he will direct the medical units in them. The experience he has had in similar work in Aberdeen, where he has been regius professor since 1930, will no doubt be of great value.

CHANGES AT ABERDEEN

Last week the Aberdeen university court approved of an extensive reconstruction scheme in Marischal College, the estimated cost of which is £144,000. The scheme has become possible through the removal of the medical school to Forresterhill, which will be completed by September of this year. Arrangements are being made for the accommodation of final-year

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medical students at Forresterhill, and the court has approved the plans for the students' residence. New recreational facilities are also to be provided, including a swimming-pool at King's College.

The remarkable changes which have taken place during the past few years in the Aberdeen medical school have made it a model that many schools would like to copy.

CORRESPONDENCE

CONTROL OF INFECTION IN CHILDREN'S WARDS

To the Editor of THE LANCET

SIR,—Everyone will agree with Drs. Dobbs and Kempthorne that "application of newer knowledge of infection and immunity will considerably diminish the frequency with which wards are closed on the appearance of an infectious fever"; but it is doubtful if any clinician of experience will endorse their statement that in measles "clinical diagnosis is not possible until the end of the highly infectious prodromal stage." The authors go on to explain that Koplik's spots are "essentially evanescent" and that their absence does not exclude measles. It is true that a small percentage of cases—it varies in different epidemics—does not develop the diagnostic enanthem, but my experience has been that "unrecognised" is usually a more appropriate term than "absent"; when a careful examination of the buccal mucous membrane is rigidly insisted on as a part of the admission technique, the percentage shows a noteworthy diminution. The spots are not evanescent in the prodromal stage—they persist for three to six days—but they do not long survive the appearance of the true rash; the distinction is important. During the recent epidemic the number of cases of measles admitted to this hospital in the prodromal stage has shown a gratifying increase over the corresponding numbers of previous years, and this increase is largely attributable to the fact that the out-patient departments of certain hospitals have displayed skill in the recognition of the real nature of conditions which have been referred to them as examples of bronchitis, laryngitis, and even appendicitis. Unless one is in the happy position of being able to carry out a preliminary segregation of three weeks for all new admissions, an occasional introduction of measles in the incubation stage cannot be avoided, but the most frequent cause of infection in a children's ward is the admission of a case in the prodromal phase; the experience of fever hospitals, which consist largely of children's wards, demonstrates that alertness in the receiving-room can reduce this danger to a minimum. Our infrequency of ward infections during the recent epidemic does not support the assertion that "it is scarcely possible to avoid *repeated* (my italics) infection of children's wards . . . during the epidemic years."

In conclusion, I might remark that though measles is highly infectious during the prodromal stage, its infectivity rapidly declines after the true rash appears; so that a case kept in a ward on "simple" or "special" isolation until the eruptive stage has been retained during the most dangerous phase, and little is gained by later transfer to an isolation hospital. I am, Sir, yours faithfully,

G. W. RONALDSON.

South-Eastern Hospital, New Cross, S.E., June 20th.

NASAL SINUSITIS AND MENTAL DISORDER

To the Editor of THE LANCET

SIR,—I feel impelled to question the conclusion of Mr. Brownlie Smith and Dr. Ross, quoted in an annotation on p. 1232 of your issue of May 28th, "that nasal sinusitis has no real ætiological significance in any of the main groups of mental disease, except for the theoretical possibility of a sinus infection producing a toxic confusional state."

Even one of their own findings gives ground for such a refutation, thus: "The highest proportional incidence was found in the manic-depressive group"; surely this indicates that the sinus disease they found in those cases was the disease common to and responsible for both the mental disorder and also "the lowered physical vitality," which latter they observe is "so often seen in those cases." Such an interpretation of their observation is not unreasonable. As a general practitioner I have seen cases of post-influenzal depression—at times the forerunner of insanity—clear up after thorough treatment of diseased nasal sinuses.

As a medical member of the Birmingham Mental Hospital committee for the past nine years, I have followed the work of Graves and Pickworth with close attention and I am satisfied that their findings and conclusions are worthy of the most careful consideration. The important point is to recognise that sinus disease is a cause of mental disorder; the percentage incidence is of less importance and must depend on the thoroughness with which investigation is carried out. In this relation it would be interesting to know the percentage incidence of sphenoidal sinus disease found by Smith and Ross amongst those cases in which suction-exploration was employed in the investigation of that sinus and to know the number of cases thus examined. These authors found that their 818 cases "showed more sinusitis than would be expected in 818 members of the general population." This is interesting in that it supports the refutation of their conclusion.

One of their suggested explanations of this increased incidence begs the whole question: "the neglect of nasal hygiene during mental illness"; that surely is the point at issue. Such an admission indicates the supreme importance of full and thorough investigation and treatment in order that all possible measures shall be taken to prevent the disease from progressing, and by the attainment of improved nasal hygiene to produce recovery.—I am, Sir, yours faithfully,

Edgbaston, Birmingham, June 15th. LOUIS GLASS.

To the Editor of THE LANCET

SIR,—Your annotation of May 28th gives wide publicity to a paper on Nasal Sinusitis and Mental Disorder published in the *Edinburgh Medical Journal* (1938, 45, 343) and I accordingly seek a similar publicity for this letter. The paper is admittedly designed as a counterblast to the work of Graves and Pickworth in the *Journal of Mental Science* (1932, 78, 459 and 653); and while the question of sportsmanship does not I suppose arise in the search for truth, I submit that where possible a counterblast should be published through the same medium as the work which is to be criticised. It is somewhat un-British to take advantage of the wider publicity afforded by a journal of general medical interest when dealing with a controversial subject the original paper upon which reached a very much smaller body of readers.

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Also, a counterblast should cover the same ground as the original, and should employ methods of investigation which are at least as thorough. I ask permission to put before your readers a comparison of the plan of the two pieces of work:—That of Graves and Pickworth comprises a careful record of a thousand cases of mental disorder investigated and treated by rhinological means over a period of five years. Their publication includes a record of the duration of the naso-pharyngeal sepsis, and the bacteriology of washings from the sinuses, with minute descriptions (averaging 2 pages each) of 33 illustrative cases and many photographs. It comprises post-mortem examination of 317 cases, examined macroscopically and microscopically; and this monumental investigation includes 2½ pages of bibliography and references. The Edinburgh report, upon the other hand, is a relatively dilettante affair. The omission of post-mortem and bacteriological examination has resulted in a most gratifying diminution in labour, so that the whole report covers only 13 pages, and gives some 13 references. The survey purports to give the nasal findings in 818 cases, but the rhinological methods employed simply do not compare in thoroughness with those used in Birmingham; and the only criteria of sinusitis admitted were apparently "the presence of pus in the nose or nasopharynx, or relative opacity to transillumination of one or more of the air cavities."

The idea that the diagnosis of chronic sinusitis depends upon the presence of pus dies hard; and it does not explain the very common case in which over a period of years there are attacks of undeniable sinusitis, gradually increasing in severity and duration. Because there is no pus between attacks, are we to say that the chronic sinusitis does not exist during these intervals? Surely not. A flare-up, complete with pus, can be precipitated by a vaccine; and the presence of a hæmolytic streptococcus in the subepithelial tissues can usually be demonstrated by the incubation of a piece of mucosa collected from an area on, say, the middle turbinate, previously sterilised.

With regard to treatment, I submit that the Edinburgh report is unintentionally but profoundly misleading. The chronic sinusitis which is associated with mental disorder is, from the published literature and also in my limited experience, of the most widespread and well-entrenched type. Mr. Brownlie Smith's radical operations upon the antra were logically conceived, and achieved the removal of the diseased tissue—the antral linings. But (except in infections of dental origin) is it the rule to find that the antra alone are involved? Our out-patient departments are thronged with patients upon whom antral operations have been skilfully performed, but whose ethmoids and sphenoids have grown steadily worse since their operations; and it is this unaccountable but prevalent assumption that chronic sinusitis is restricted to the antra that has given rise to the derisive saying "Once a sinus operation, always a sinus operation." An abdominal surgeon who removed half an infected appendix would expect the remaining half to show resentment in no uncertain way at its omission from the scope of the operation, and it is surprising that rhinologists should ever have expected that septic foci in the sinuses should behave differently. Modern rhinological opinion in America, Austria, Australia, and the United Kingdom, while tending more and more to limit surgical intervention, demands that an operation shall include in its scope *the whole area involved in the infection.* The operations which constituted the treatment of the sinusitis in the Edinburgh work were not conceived in this spirit. In all seriousness, could any rhinologist quote "removal of polypi" as a considered attempt to remove all the sinus disease of which the polypi are a result? Again, is "inflammatory condition of the middle turbinal" a recognised diagnosis, or is removal of the turbinal really suggested as a removal of all the disease?

The entire absence of post-mortem examination in this investigation invalidates it considerably (or else the time spent in such examinations in other departments of medicine is to be deplored). While the omission of bacteriological examination, in 1938, reminds me of the story of a very senior consultant before the war who, when twitted with his disregard of microscopical evidence, said, "God gave me these two eyes; and anything I can't see with their help wasn't meant for me to look at!"

I cannot pose as an unprejudiced observer, for I have made the pilgrimage to Birmingham. My own observations have in their small way caused me fervently to range myself upon the side of Graves and Pickworth; and until work of equal weight is thrown into the balance upon the opposite side, there I shall stay.—I am, Sir, yours faithfully,

London, June 15th. BEDFORD RUSSELL.

THE FIRST APPENDICECTOMY

To the Editor of THE LANCET

SIR,—Prof. A. W. Sheen asks in your issue of June 11th whether it is true that Charters Symonds performed the first appendicectomy en froid in this country. It is true not only for this country, but, according to Howard Kelly, for all countries. Charters Symonds and his medical colleague, Mahomed, had become interested in the post-mortem lesions of appendicitis, which had been closely studied at Guy's ever since Bright and Addison gave their classical description of the disease in their "Elements of the Practice of Medicine," published in 1839. After much thought and discussion Symonds performed the first "interval" operation for appendicitis at Guy's Hospital on August 24th, 1883. He made a lateral incision without opening the peritoneum. In a paper published two years later, shortly after Mahomed's untimely death, he wrote, "I believe I am correct in saying that this is the first case in which a concretion or calculus has been removed from the appendix without at the same time opening an abscess, and the credit of whatever value rests in the procedure must be given to my lamented colleague Dr. Mahomed, at whose suggestion the operation was undertaken, and who advocated the inguinal incision in opposition to that along the linea semilunaris proposed by myself." Cases of appendicitis at that time were admitted under the care of the physicians, and it was some years before Symonds could find any other of his medical colleagues willing to give him an opportunity of repeating the operation. I am, Sir, yours faithfully,

Guy's Hospital, June 16th. ARTHUR F. HURST.

FEMORAL THROMBOSIS

To the Editor of THE LANCET

SIR,—In your issue of June 11th Dr. W. N. Leak asks about the age-incidence of the cases of femoral thrombosis recorded in my article of May 28th. In the cases recorded, the age-incidence at the time of onset of the thrombosis varied from 13 to 63. Eleven of the patients were under 20 at the time of the thrombosis, and three were under 18 (viz., 13, 16, and 17). In the first two of these three the thrombosis

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was a complication of typhoid or paratyphoid, and in the third case the condition was a white leg. As a whole, femoral thrombosis is relatively infrequent during the growth period of life and is almost unknown in children. This immunity in early life is particularly marked in the case of post-operative thrombosis and this complication with pulmonary emboli is extremely rare in childhood. Personally I do not remember ever having seen a clear-cut case of deep femoral thrombosis in a young child. At the same time it may be true that recovery is likely to be more complete in younger patients.

With regard to the first case quoted by Dr. Leak, of the baby of 7 months with pyæmia and abscesses following acute osteomyelitis, I am afraid that in the presence of such extensive acute septic complications it would be difficult to regard this as a clear-cut case of femoral thrombosis. Writing of his second case, of severe white leg treated with Contramine (B.D.H.), Dr. Leak himself admits that the limb still shows slight swelling at the end of the day and a tendency to develop painful ulcers after slight injuries.

My object in recording these 85 cases of femoral thrombosis was to discuss the bearings of the ultimate or remote clinical picture upon the possible ætiological factors. In the series recorded it was certainly true that in no patient did the limb return entirely to normal. I was, however, careful to point out that in the absence of complications many patients show a tendency towards recovery. I have no personal experience of the treatment of femoral thrombosis either by means of contramine or by injections of vitamins A and D; but on the evidence put forward by Dr. Leak I cannot alter my opinion as to the permanence of some degree of circulatory impairment after femoral thrombosis, no matter how great the recovery from the acute phase.

I am, Sir, yours faithfully,

Harley-street, W., June 18th. REGINALD T. PAYNE.

SUBCUTANEOUS EMPHYSEMA IN ASTHMA

To the Editor of THE LANCET

SIR,—I read with interest the article on subcutaneous emphysema and pneumothorax in bronchial asthma, written by R. W. Elliott, house physician at the Royal Infirmary, Sheffield, and published in your issue of May 14th. He states that he was unable to find reports of more than four cases of subcutaneous emphysema complicating asthma, and I would therefore like to refer him to an article in the *American Journal of Medical Sciences* for May, 1938, in which Drs. L. Rosenberg and J. Rosenberg, after reporting their own case, add seventeen previously published. Apparently this condition is not too rare a complication of bronchial asthma.

I was called in consultation to see a patient of Dr. C. W. Kenney at the Syracuse Memorial Hospital, a woman 21 years of age who was seven months pregnant, who had had moderately severe hay-fever all summer. Recently she had developed a persistent cough, and on the night before admittance to the hospital she had an unusually hard coughing spell, followed by dyspnœa. In her past history the fact was elicited that she had had operation for quinsy of the throat on two occasions.

Examination showed a rather extensive subcutaneous emphysema extending up both sides of the neck and over the chest. X rays did not reveal any pneumothorax. It was thought in this particular case that a fracture of the hyoid bone might be the source of entry of the air into the subcutaneous tissues; or the previous quinsy operations might have caused some weakness in the wall of the pharynx as a further source of the adventitious air; but X ray of the body or cornu of the hyoid bone was negative and there was no tear demonstrable in the pharynx adjacent to the tonsillar tissue.

This case has not been reported before.

I am, Sir, yours faithfully,

HENRY H. HAFT.

Medical Arts Building, Syracuse, N.Y., June 8th.

THE TRIAL LABOUR—AND AFTER

To the Editor of THE LANCET

SIR,—I am very interested in your leading article on this subject. I have never been an advocate of trial labour for several reasons: first, it has always appeared to me to be rather a misleading term, and I have never been quite sure what its advocates mean by it.

One idea seems to be that a trial labour is one conducted with all possible asepsis and antisepsis so that, should it become necessary, a Cæsarean section can be performed without undue risk; but, surely, every labour should be conducted with all possible antiseptic and aseptic care, so every labour is a trial labour.

Another view seems to be that one should not make any attempt to decide if disproportion is present, or likely to become present in two or three weeks, but just wait and see if it is present when labour fails to progress. Surely this is a retrograde step? We should endeavour to make up our minds when the fœtus has reached the optimum size, and, if labour does not ensue, induction of premature labour is more scientific. Admittedly, human error will come into some cases, but the more we strive to form correct judgment the fewer will be the errors.

Your article rightly stresses the importance of doing everything in our power to avoid a stillbirth at the first pregnancy, and I strongly agree with all that is said of the effect of frustration of the maternal urge. The loss of a first baby is so serious that I have always opposed the dictum "never a Cæsarean section with the first baby."

The notes of the case quoted hardly seem to me to come within the category of trial labour at all. The first pregnancy was a breech presentation, diagnosed during pregnancy, and external version was apparently successfully performed and presumably, as not infrequently happens, the fœtus reverted to breech, which fact apparently was not noticed until labour had commenced. The child when born weighed 9 lb., and I do not consider that a fœtus of this weight, presenting by the breech, at a first labour, can be classified as a trial labour. The patient's second pregnancy certainly afforded every suggestion for consideration of a Cæsarean section in the interests of the child. One could hardly call it a trial labour even if it had been left, and in my opinion a Cæsarean section was completely justified.

Finally, I fail to see why the mother was "faced with the probability of further operations for the birth of any future children." If there is good union of the uterine wall there is no reason at all why subsequent labours should not be normal labours, provided a vertex presentation is present and there is no disproportion.

I am, Sir, yours faithfully,

LOUIS CARNAC RIVETT.

Harley-street, W., June 21st.

To the Editor of THE LANCET

SIR,—It is a sign of the times that you should have deemed the subject of trial labour worthy of a leading

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article. Opinions are still divided as to the best course to adopt in those difficult cases in which there appears to be some disproportion between the head and the pelvic brim. In some hospitals in this country trial labour has replaced induction as a method of treatment for this condition. There are other schools, more operative in their attitude, in which the Cæsarean section rate is high for this type of case. In the clinical example cited the fact that a stillbirth resulted from the breech delivery can hardly be held as an indictment against trial labour since it is with a vertex presentation that the test or trial type of labour is usually planned. In certain cases of disproportion there is a definite place for trial labour provided that institutional facilities and an obstetric team are available, and under these conditions its practice should be extended.

I do not concur with your statement that "the mother is now faced with the probability of further operations for the birth of any future children." Even in disproportion the dictum of "once a Cæsarean always a Cæsarean" does not always hold true. In the first instance the disproportion might be due to poor flexion of the head associated with a posterior position; this does not mean that such a condition will be found in all subsequent pregnancies. I can recall from my own experience a case in which a doctor's wife was given a trial labour for the above condition at her first delivery where the occiput was in the posterior position. Owing to fœtal distress a lower segment Cæsarean section was performed. She became pregnant again the year after. Careful examination at the 38th week revealed an anterior position of the occiput without any disproportion, and she delivered herself normally at term of a baby one pound heavier than her previous one. In the February issue of *Surgery, Gynecology and Obstetrics* such authorities as Prof. F. W. Lynch of California and Prof. J. Fraser of Montreal plead for more conservatism in obstetrics. In America the number of Cæsarean sections is increasing at an alarming rate and maternal mortality and morbidity have been found to be greatest in those States with a high Cæsarean section rate. It is recognised that this operation is now being abused and that in many cases of so-called disproportion it is done unnecessarily. Had such patients been allowed to have a test of a few hours of labour the floating head would often have become engaged.

If I may quote from the 1936 report of my obstetric unit in Hong-Kong, I would call attention to 2245 deliveries with a stillbirth-rate of 3·7 per cent. (84 stillbirths). Only 7 per cent. of these mothers had received antenatal care. Cæsarean section was done 7 times; in 5 cases this was for disproportion and in 2 of these the operation was the termination of trial labour. The innate dislike and fear of the Chinese (attributable to Confucian doctrines) for any sort of mutilation by operation forced one to temper judgment with conservatism and to adopt a less radical attitude towards obstetrics than is practised in the West.

There is one point in the conduct of trial labour which cannot be stressed too strongly. The fœtal heart must be particularly watched, since a change in its rate during the first stage is an indication for termination of labour by Cæsarean section (lower segment). Negligence on the part of the midwife in this respect can be directly responsible for the loss of the baby. One fully appreciates the danger of the mental trauma associated with the loss of a first baby; but proper selection of cases and judgment in the conduct of labour will help to reduce the stillbirth-rate. As in all things, *in medio tutissimus ibis.*

I am, Sir, yours faithfully,

London, June 18th. WILLIAM C. W. NIXON.

TO GIVE OR TO GRAB

To the Editor of THE LANCET

SIR,—It was with some surprise that I read a report in yesterday's daily press of a speech made by Sir Henry Gauvain to the nurses at the Treloar Cripples' Hospital, Alton.

It is all very well for Sir Henry to advise nurses when seeking fresh employment "not to ask what you can get but what you can give. Give, don't grab, and then you will get," but he ought, surely, to be aware that arguments of that sort cut both ways. Let his advice be given to the hospital authorities too! Perhaps, if they carry it out in relation to their nursing staff, they may be rewarded by a healthier, happier staff, the better able to give efficient and enthusiastic service.

In this competitive day and age nurses, along with other sections of the community, have learnt that the very structure of that community—of which they are an integral part—puts a premium on the principle of "Grab, don't Give," that the degree to which this principle can be carried out in practice has become, in fact, the criterion of success in the circle of big business and finance.

Why expect, then, that the further sacrifice necessary to set an example in ethical social behaviour should come from that section of the community already so engaged?

And in any case, let Sir Henry Gauvain, and all those members of the medical profession who view unsympathetically the fight for better conditions in which the nurses are at present engaged, remember this: that all over the country there is a shortage of nurses and Sir Henry's attitude in no wise contributes to the solution of this very acute problem.

I am, Sir, yours faithfully,

T. FRANCIS JARMAN.

Tuberculosis Clinic, Bridgend, June 20th.

CONVULSION THERAPY IN SCHIZOPHRENIA

To the Editor of THE LANCET

SIR,—The letter by Drs. Gillies and Dunlop in your last issue appears to be based partly on a misunderstanding of our attitude towards convulsion treatment, and partly on a conservatism that is surprising in view of their own enterprise as pioneers of the treatment in this country.

It has never been our intention to criticise the convulsion therapy adversely, but on the contrary to attempt to facilitate its use by drawing attention to a new and more convenient convulsive agent. In justifying our work we naturally enumerated the known disadvantages of the substance hitherto used; these disadvantages have been described by almost every author on the subject, and even if they may not appear very serious and can to some extent be met by skilled technique, it is surely worth while to attempt to eliminate them altogether. The inquiries we have received since the publication of our article show that such a possibility would be welcomed by a number of workers.

Drs. Gillies and Dunlop believe that the states of fear which sometimes accompany convulsion therapy are due to the attitude of the physician, and only occur after abortive reactions. We are unable to

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agree with either proposition, and are supported in this by most of the recent literature. We hope to have an opportunity of discussing this matter further at the forthcoming annual meeting of the Royal Medico-Psychological Association. In any case, we have not claimed that Triazol 156 is perfect in this respect, but only that its advantages and convenience are such that it should be given a more extended trial, and that it may come to supersede Cardiazol. The perfect convulsant has probably still to be found; and it would certainly be regrettable if its discovery were to be delayed through a mistaken loyalty to the drug that happens to have been first in the field.

We are, Sir, yours faithfully,

W. MAYER-GROSS,
ALEXANDER WALK.

Cane Hill Hospital, Coulsdon, June 20th.

ÆTIOLOGY OF PEPTIC ULCER

To the Editor of THE LANCET

SIR,—I have read with particular interest your leading article last week, and must express my admiration for your ingenuity in providing arguments for the construction of an acceptable theory. Alas, I am afraid that in spite of your gallant attempt to solve this medical jigsaw puzzle, little progress will ensue from the line of thought which you indicate. Your deductions, although based on well-established facts, are unfortunately dependent on faulty interpretation and must necessarily lead to the wrong conclusion.

Your theory stands or falls by the *conditio sine qua non* contained in the last sentence of your leader: "It would be necessary also to assume that an acute lesion always precedes a chronic ulcer." I most emphatically agree that this is the stumbling-block of the whole problem, but what arguments are there to justify so grave an assumption? Is it based on Prof. Stewart's work? If so, may I quote his own words? On the existence of subacute ulcers he half-heartedly says:—

"In the course of 4000 carefully observed post mortems, I have seen only 14 examples of gastric ulceration which I was *prepared* (my italics) to place in this class, as contrasted with 117 cases of acute and 89 of chronic ulceration of the stomach. In view of the difficulties of differentiation, no attempt has been made to separate a sub-acute group of duodenal ulcers, but there is little doubt that many of the anterior wall ulcers which perforate are in the transition stage."[1]

But in view of the "difficulties of differentiation" is one not justified in classing these ulcers simply as acute ulcers?

In your recent annotation (May 14th, p. 1122) you rightly attach great importance to the experimental ulcer, calling special attention to the hormone ulcer and cinchophen ulcer. I think there can be no question that the hormone ulcers produced either by Beattie's method or by Dodds's method must be unequivocally classified as acute ulcers. Of the cinchophen ulcers you say: "There is thus a remarkable parallelism in behaviour and in structure between cinchophen ulcer in the dog and human peptic ulcer." But here again I am afraid I do not agree with your interpretation. May I quote from the original paper[2]: "Peptic ulcer caused by Cinchophen heals in the same way as the experimental ulcer described by Mann. Within three days after discontinuation of administration of Cinchophen the layer of necrotic tissue over the base of the ulcer disappears." The authors mention certain characteristic signs and symptoms:

"During the first few days the dogs appear somewhat toxic, especially from one to six hours after administration of the drug . . . an ulcer was not noted before the appearance of tarry stools had been observed . . . . Within the first few days the stomach appeared somewhat œdematous and hæmorrhagic and the mucosa is more or less covered with small linear erosions."

It should be noted that no hyperchlorhydria was present and that "the peptic ulcer already described was produced by methods of administration of cinchophen in which the drug was not in direct contact with the mucosa," proving without doubt that cinchophen acts as a systemic poison and that the ulcer it produces is identical with the usual experimental ulcer, and, therefore, of the acute kind.

When we consider the clinical aspects we cannot help being struck by the difference between the experimental acute ulcer and the chronic ulcer of human beings. They have no symptom in common and there is no indication of even a remote mechanism that may bridge the gap. We are faced with two conditions which are entirely independent of each other—two separate diseases—and unless this primary fact be recognised, no further progress can be made. I have searched in vain for this differentiation in the text-books of pathology, yet whenever I discuss the subject with pathologists they do not hesitate to agree with my point of view. Both pathologically and clinically the whole situation appears to be unnecessarily muddled, because the most elementary considerations are being overlooked and complications created in what, to my mind, is a very simple matter. The position is well expressed by the French saying *Chercher midi à quatorze heures*. Although my theory of the "Causation of Chronic Gastro-duodenal Ulcer" was published as long ago as 1931, I am still waiting for arguments that will disprove it.—I am, Sir, yours faithfully,

J. JACQUES SPIRA.

Chesterfield-gardens, W., June 20th.

[1] Hurst, A. F., and Stewart, M. J., Gastric and Duodenal Ulcer, London, 1929, p. 91.
[2] Bollman, J. L., Stalker, L. K., and Mann, F. C., *Arch. intern. Med.* 1938, 61, 119.

CUTANEOUS APPLICATION OF FOLLICULAR HORMONE

To the Editor of THE LANCET

SIR,—Since the appearance of my article on the above subject in your issue of May 14th my attention has been drawn to a paper that I ought to have mentioned. In the *Zentralblatt für Gynäkologie* last year (1937, 61, 1094) M. Ito, S. Hajazu, and T. Kon reported that œstrone in 60 per cent. alcoholic solution is readily absorbed through the skin of mice, having as much effect as the same quantity in aqueous solution injected subcutaneously. I regret having overlooked this work.

I am, Sir, yours faithfully,

Jerusalem, May 25th. BERNHARD ZONDEK.

ROYAL COLLEGE OF SURGEONS IN IRELAND.—The result of the annual elections at the Royal College of Surgeons in Ireland was announced last week. Both the president and vice-president were elected unopposed. Mr. William Doolin, who succeeds Mr. A. A. McConnell as president, is one of the surgeons to St. Vincent's Hospital and also to the Children's Hospital in Temple-street. He is one of the direct representatives of the profession on the Irish Free State Medical Registration Council, and is editor of the *Irish Journal of Medical Science*. He has been vice-president of the College for the past two years. Mr. Henry Stokes, the new vice-president, is senior surgeon to the Meath Hospital, Dublin, and surgeon to the Drumcondra Hospital. He served with distinction in the late war as lieut.-colonel in the R.A.M.C.

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PUBLIC HEALTH

The Diagnosis of Tuberculosis from Sputum

A SHORT memorandum[1] on the demonstration of tubercle bacilli in sputum published under the ægis of the Joint Tuberculosis Council has been written by three of their members, Prof. W. H. Tytler, Dr. P. W. Edwards, and Dr. H. G. Trayer. It is intended to present methods, relevant data, and advice for the guidance of medical officers in the tuberculosis services, and is therefore largely a summary of established practice with observations on the laboratory methods favoured by the authors, who supply also some hitherto unpublished records relating to comparison of cultural and animal inoculation tests. An additional table of results of such comparisons is included by Dr. K. A. Jensen of Copenhagen.

Broadly speaking, the report is a critical examination of the three well-recognised methods of searching for the tubercle bacillus in the clinical laboratory—viz., (1) direct microscopical examination, (2) cultural tests, and (3) animal inoculation. With regard to (1) the reader will be much interested to discover from the authors' calculation that a direct film examination seldom gives positive results with a sputum containing fewer than 25–50 bacilli per c.mm. On the vexed question of cultural versus animal inoculation tests, which is exercising the minds of many clinical pathologists at the moment, the authors incline to the view that although many bacteriologists still adhere to the older view that the guinea-pig is better than the culture tube, there are now on record a number of large-scale comparisons made at reliable laboratories which show a definite if small advantage for the cultural method when carefully applied. Obviously the direct film examination method is firmly entrenched, and on the ground of practicability is likely to remain the standard form of examination, but most laboratories have now to decide whether in sputum-negative cases to supplement this examination with cultural test or animal inoculation or both. There are many factors which may determine this choice, and no hard and fast ruling can be made.

Specialist Service for Bristol Municipal Hospitals

A scheme has now been agreed under which Bristol corporation will secure specialist services in medicine and surgery for patients in institutions under the control of their health committee. This is the outcome of discussions between this committee, the professors of clinical medicine and surgery of the University of Bristol, and the committees of the Bristol Royal Infirmary and the Bristol General Hospital. The two professors will be responsible respectively for the services which are to be rendered by four surgical teams, each consisting of two surgeons, and by three visiting physicians or teams of physicians. The general surgeon and the consultant physician for heart cases already attached to Southmead Hospital will be included in the teams of specialists. The other visiting surgeons and physicians at Southmead are carrying out work outside the scope of the present arrangements which will therefore not be affected. The internal administration of Southmead and any other hospital of the corporation will remain the responsibility of the medical superintendent, who will convene and attend regular meetings of the specialist staff and convey their recommendations to the medical officer of health for submission to the health committee.

The payments for these services have been provisionally agreed at £900 per annum for each service, subject to annual review. It is proposed that one surgeon and one physician shall visit Southmead every day and a surgical and a medical team at least twice a week.

The distribution of cases between the Bristol Royal Infirmary, the Bristol General Hospital, and Southmead Hospital will in future be governed by the following rules:—

1. No Bristol patient is to be kept waiting if a bed is available at any of the three institutions.
2. Any strong wish expressed by a patient to enter any particular institution will be taken into account.
3. Though no hard and fast rules are laid down, in general acute cases and emergencies are to be admitted, as at present, to the two voluntary hospitals and cases likely to require more prolonged treatment to Southmead.

This scheme of coöperation, which was passed by the council on June 14th, was worked out at the instigation of the health committee, who realised that the provision of specialist services is essential for the recognition of the standard of work at Southmead Hospital as equal to that done at the voluntary hospitals in the neighbourhood.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JUNE 11TH, 1938

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 1 (at Gravesend); scarlet fever, 1743; diphtheria, 912; enteric fever, 30 (31 "expected"); pneumonia (primary or influenzal), 801; puerperal pyrexia, 160; cerebro-spinal fever, 20; acute poliomyelitis, 5; encephalitis lethargica, 4; dysentery, 32; ophthalmia neonatorum, 91. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on June 17th was 3898, which included: Scarlet fever, 776; diphtheria, 984 (carriers 44); measles, 971; whooping-cough, 256; puerperal fever, 9 mothers (plus 4 babies); encephalitis lethargica, 280; poliomyelitis, 2. At St. Margaret's Hospital there were 22 babies (plus 9 mothers) with ophthalmia neonatorum.

Deaths.—In 126 great towns, including London, there was no death from small-pox, 1 (0) from enteric fever, 12 (0) from measles, 4 (0) from scarlet fever, 11 (0) from whooping-cough, 23 (4) from diphtheria, 43 (12) from diarrhœa and enteritis under two years, and 30 (6) from influenza. The figures in parentheses are those for London itself.

The death from enteric fever was reported from Edmonton. There were 4 fatal cases of influenza at Manchester, while Birmingham, Liverpool, and Manchester reported respectively 5, 4, and 3 deaths from diarrhœa and enteritis under two years.

The number of stillbirths notified during the week was 278 (corresponding to a rate of 43 per 1000 total births), including 45 in London.

PEIPING UNION MEDICAL COLLEGE.—Dr. I. Snapper, professor of medicine in the University of Amsterdam and director of the clinic for internal medicine in the Wilhelmina Hospital, has been appointed to the chair of medicine at the college. Dr. Snapper expects to arrive in Peiping for the opening of the next session in September.

[1] The Demonstration of Tubercle Bacilli in Sputum. A Report issued by the Joint Tuberculosis Council. Printed by the British Legion Press, Preston Hall Industries Incorporated, Preston Hall, nr. Maidstone.

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INDIAN MEDICAL SERVICE

ANNUAL DINNER

THE annual dinner of the Indian Medical Service, held at the Trocadero on June 14th, was attended by 133 officers. Major-General E. W. C. Bradfield, the director-general, presided, and the guests included the Marquess of Zetland, Secretary of State for India. The members of the Service present were :—

Major-Generals : Sir Robert McCarrison, I. M. Macrae, C. W. F. Melville, Sir John Megaw, Sir Frank Connor, H. R. Nutt, T. G. Ferguson Paterson, Sir Cuthbert Sprawson, Sir Thomas Symons, Sir Leonard Rogers, and G. Tate.

Colonels : H. Ainsworth, Sir Charles Brierley, H. H. Broome, H. M. Cruddas, H. R. Dutton, A. B. Fry, J. Fuller-Good, T. A. Granger, C. R. M. Green, W. H. Leonard, G. R. Lynn, H. M. Mackenzie, F. P. Mackie, A. J. Macnab, A. A. McNeight, A. A. C. McNeill, Sir Richard Needham, C. H. Reinhold, H. E. Stanger-Leathes, J. Taylor, R. G. Turner, J. Norman Walker, and C. N. C. Wimberley.

Lieut.-Colonels : W. G. P. Alpin, F. J. Anderson, C. H. Barber, Norman Briggs, G. T. Burke, H. P. Cook, H. S. Cormack, D. G. Crawford, J. M. Crawford, H. J. M. Cursetjee, J. B. Dalzell-Hunter, I. Davenport-Jones, W. E. R. Dimond, F. F. Elwes, S. C. Evans, S. M. A. Faruqi, J. K. S. Fleming, H. R. B. Gibson, E. S. Goss, V. B. Green-Armitage, F. Griffith, A. E. Grisewood, R. Hay, S. N. Hayes, W. L. Harnett, J. M. R. Hennessy, B. Higham, H. Hingston, J. M. Holmes, E. V. Hugo, M. L. C. Irvine, H. H. King, J. B. Lapsley, J. C. H. Leicester, J. G. McCann, D. McDonald, R. F. D. MacGregor, H. M. Mackenzie, G. R. McRobert, S. A. McSwiney, E. C. G. Maddock, S. N. Makand, G. E. Malcomson, W. A. Mearns, S. H. Middleton-West, T. R. Mulroney, Clive Newcomb, C. Newton-Davis, H. K. Rowntree, J. D. Sandes, J. A. Sinton, R. B. Seymour Sewell, A. L. Sheppard, H. B. Steen, R. Steen, Ashton Street, W. A. Sykes, R. Sweet, C. Thomson, E. Owen Thurston, P. Verdon, E. L. Ward, E. E. Waters, H. Williamson, and R. E. Wright.

Majors : H. C. Brown, J. A. Cruickshank, J. A. W. Ebden, Sir T. Carey Evans, P. Heffernan, E. S. S. Lucas, V. B. Nesfield, C. G. Seymour, H. S. Waters, and R. A. Wesson.

Captains : A. H. Barzilay, G. F. A. Condon, K. Cunningham, C. H. Dhala, Dev Dutt, G. K. Graham, R. J. Jarvie, B. N. Khan, M. E. Kirwan, W. A. N. Marrow, P. L. O'Neill, G. R. C. Palmer, R. I. Reid, M. Sendak, Man Singh, and G. E. S. Stewart.

Lieutenants : D. M. Black, J. H. Briscoe-Smith, J. G. Fife, A. C. Glendinning, G. K. Graham, N. D. Jekyll, G. C. Retz, and A. R. Woodford.

The guests were Lord Zetland, General Sir Sydney Muspratt, Major-General W. Brooke-Purdon, Dr. N. Hamilton Fairley, Dr. N. G. Horner, and Dr. T. F. Fox.

General BRADFIELD, proposing the toast of The Service, quoted Michael Foster's saying that the greater part of us has come down from the past. Wherever he went he was filled with pride at what officers of the I.M.S. had done in building up medical organisation in India. Eight medical schools, producing 35,000 practitioners, owed their existence to the Service, and in research it had played no small part in what was called the conquest of the tropics. Difficulties there were, had been, and always would be. Medicine, with more and more specialties, was more exacting than formerly. Not only must the civil surgeon be the best qualified man in his district but the Service wished to give all the help it could to the large body of practitioners for which it was responsible. The I.M.S. officer to-day was doing as good work as any of his predecessors and, though the pace was faster and called for more ability and initiative, he was holding his own. It was noteworthy that 52 per cent. had qualifications higher than the M.B.; and 82 were F.R.C.S., 13 M.S., 14 F.R.C.P., 36 M.R.C.P., and 86 D.P.H. At a dinner of research workers at Delhi last December the atmosphere had been "distinctly pre-war," and he found new entrants entirely satisfied with the career they had chosen. There were now 264 Indian officers in the Service: but "in the I.M.S. we have no racial problem: they are just as keen on the Service's good name—just as jealous of its traditions—as any of us." General Bradfield's own faith in the Service was, he said, as great as on the day he joined it. In Isaak Walton's words, "The Almighty might have invented a better life; but he didn't."

The toast of The Chairman was proposed by Major-General C. W. F. MELVILLE, who said that no man was more truly the epitome of the Service, and Lord ZETLAND concluded the speeches with a happy impromptu.

COURSES FOR MIDWIVES

FROM the beginning of next year every practising midwife will be obliged to attend from time to time a course of post-certificate instruction. One of the duties of the Central Midwives Board is to lay down rules for such courses, and their new regulations are made in the belief that most midwives will regard professional refreshment of this kind as a privilege and not as a penalty.

The aim, as set out in a memorandum by the Board, is twofold: first, to refresh the midwife in her theoretical knowledge, her practical skill, and her general outlook; and secondly, to give her new information. Since the midwives attending courses will have been trained at different schools and will have acquired settled habits and methods of work, it is concluded that the courses should consist almost entirely in personal tuition; "the teacher will require to observe the midwife at work, to decide what are her good points and what are her weak points, and by personal discussion and explanation show the midwife how to eliminate the bad while retaining the good habits and methods." In this task skill, insight, and patience will be necessary. A further condition of success however is that the courses should be designed and conducted specially for practising (as opposed to pupil) midwives, and should not involve an undue amount of routine work in a hospital or on a district. "If, instead of being required to attend a special course, the midwives are merely required to return to hospital, their own or another, some will derive real profit, but many will slip through with only a superficial gain."

The instruction, it is felt, should be both theoretical and practical, all theory being related to practice, and should make use of both hospital and domiciliary facilities. Four weeks in residence is considered a minimum, and though more would be advantageous the Board believes that a month's course at intervals of not more than seven years will prove far more useful than attendance at more intensive residential courses at shorter intervals or longer and more frequent non-residential courses. Free from the distractions of practice, a midwife will profit by contact with other midwives and the informal talks of teachers and fellow students, and during a month her teachers should have time and opportunity to become acquainted with her and give her the necessary personal instruction. The rules laid down for institutions that give such training include provision of a separate bedroom for each midwife on the post-

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certificate course and a common-room reserved for them. It is thought best that recognition should be granted only to institutions that will conduct each year approximately ten courses each attended by ten midwives, and in such circumstances the staff is to consist of not less than three midwife teachers, the most senior of whom should if possible hold the midwife-teacher's certificate. If the course is to include obstetric analgesia its duration must be at least five weeks.

Other rules have been made concerning supervisors or assistant supervisors of midwives and the conditions under which they too must receive periodical instruction.

TUBERCULOSIS: A KEY PROBLEM OF INDIA

Sir JOHN MEGAW gave this title to an address delivered at a meeting held in London last Tuesday under the auspices of the East India Association and the Overseas League, the Marchioness of Linlithgow presiding.

The Indian situation, he said, could be understood only in the light of experience gained in other countries where reliable evidence was available. Information about the prevalence of tuberculosis in India was very scanty; there was no record of the tuberculosis death-rate except in the cities and large towns—e.g., in Cawnpore, where it was 4600 per million, or in Calcutta (2500). The death-rate from tuberculosis among girls and young women who live in purdah was appalling, being several times higher than that of males in the same age-group. Medical men in India were almost unanimous in declaring that the disease was increasing rapidly, and that it was extending to rural areas that were formerly free from infection. They also reported that when the disease spread to new localities it assumed a more virulent form than in places previously affected. Estimates based on various data suggested that there were at least 1½ to 2 million cases in India, while all the evidence pointed so strongly to a serious increase in the disease that an accurate survey of the situation was urgently needed.

Meanwhile, however, antituberculosis measures, both preventive and remedial, must be vigorously carried out. It was obviously impracticable to isolate all tuberculous persons, but there was no need to be unduly discouraged by this, for with tuberculosis, as with all other public health problems, the best plan was to teach people to do things for themselves. Things done for the people must necessarily be expensive and of temporary benefit, whereas things done by the people themselves were both economical and durable. The spread of infection in India could only be prevented by education. The people must be taught, by schools, printing press, public lectures, cinemas, and broadcasting, how droplet and alimentary infections were conveyed and how they could be avoided. Preventive measures which aimed at building up bodily resistance against the bacillus were essential parts of the programme; these constituted a complex problem in themselves. The key unit in every State was the family, and the only prosperous States were those in which each family lived a well-planned life. The heads of every family must therefore be taught how to plan a satisfactory existence for those dependent on them, and here was where the responsibility of governments came in.

The most difficult part of the task was to bring about the change in the outlook of the people without which better conditions of life were unattainable. Inefficient methods of agriculture, wasteful customs, early and improvident marriages were some of the chief handicaps which the people of India had imposed on themselves. There was good reason to believe that if a quarter of the money now spent on education in India were allotted to a scheme of instruction in life planning, the problem of tuberculosis and most of the other great problems could be solved. The first essential was to have a sound plan, and the preparation of such a plan demanded the coöperation of men with practical knowledge of agriculture, industry, economics, hygiene, education, and, above all, of men with a sympathetic understanding of the psychology of the Indian peasant. Technical advisers were needed, whose teaching should be coördinated and translated into simple language. When once a plan had been prepared, the rest would be easy; it would only be necessary to carry out a system of mass propaganda on the lines that had always proved successful elsewhere.

Lady LINLITHGOW spoke of the work that was planned in connexion with the King George V Thanksgiving Fund in India. The income from this fund amounted to £4000 yearly. It had been decided that 95 per cent. of the money collected in each province should go back to that province. Of the remaining 5 per cent. part would be devoted to paying for the services of an expert whose services would be available in helping to plan appropriate schemes. It was also hoped to establish a model clinic, and to enlarge the scope of existing buildings. The preventive side of the campaign was to her the whole crux of the situation, and there was also need for after-care schemes.

Other speakers included Lord Goschen, chairman of the Overseas League, Major-General E. W. C. Bradfield, director-general of the Indian Medical Service, Sir Cuthbert Sprawson, Dame Edith Brown, and Sir Leonard Rogers, F.R.S.

EPSOM COLLEGE

The eighty-fifth annual general meeting of the governors was held at 49, Bedford-square, W.C., on June 17th, with Dr. Henry Robinson in the chair. The result of the last election of pensioners and foundation scholars was announced. The chairman then referred to the loss which the college had sustained by the death of Sir Raymond Crawfurd, who was for 23 years a member of the council, and its chairman for 13 years. In presenting the report, Dr. Robinson said that over 400 subscribers had signed seven-yearly covenants. The report gave interesting details of the progress of the school in work and in play, with some outstanding records attained by Epsom boys and Old Epsomians, and showed that Old Epsomians were among the recent benefactors of the college. For instance, Colonel W. L. Crawford had given £5000 to found a leaving scholarship and £250 to found a prize for an essay dealing with the overseas empire; Mr. E. E. Fisher, F.R.C.S., had sent £250 as an expression of gratitude to the college; the sons and daughters of the late Mr. William Murray Wilson had established a prize in his memory; and Dr. W. Rushton-Parker had given £1000 to be expended for the benefit of science and £100 for the library. Mrs. H. G. Tetley had given a further £500 to augment the Tetley scholarship fund which she founded a few years ago.

The following members of the council were re-elected for a further period of three years: Mr. D. C. Bartley, Sir John Broadbent, F.R.C.P., Surgeon Vice-Admiral Sir Reginald Bond, F.R.C.P., Sir Ernest Goodhart, Mr. R. M. Handfield-Jones, F.R.C.S., Mr. Frederick Morris, Sir Cosmo Parkinson, Dr. Harold Spitta, and Mr. T. Hollis Walker. Dr. Daniel Twining was elected to fill a vacancy, and Dr. C. E. Douglas was elected a vice-president. Colonel Norman C. King, Mr. H. H. Rew, and Mr. H. A. Deeker were appointed auditors for the ensuing year.

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OBITUARY

ARTHUR HAWKYARD, M.D. Durh., LL.D. Leeds

IN Dr. Arthur Hawkyard, who died on June 17th at the age of 76, Leeds loses one of its most respected citizens and the local profession one of its best-liked members. He was a native of Leeds and studied medicine first at the Leeds School of Medicine and then at Edinburgh, where he qualified in 1882. It was characteristic of his studious and persevering character that as late as 1905 he was called to the bar of the Inner Temple and in 1907 took his M.D. at Durham.

On qualifying Dr. Hawkyard became house surgeon at the Rothwell Hospital and then for some years worked at the Leeds Workhouse Hospital under Dr. James Allan. He often referred to the valuable training he had at the hands of this most conscientious officer. In 1887 he started in practice in Hunslet where he met with immediate and lasting success. He was regarded in the district as "a conspicuous representative of the good physician in general practice." He took a prominent part in public affairs and was the senior lay magistrate for the city of Leeds and a member of the city council and of the Hunslet board of guardians for many years. He served for a term as alderman and in 1930 was elected lord mayor of Leeds, the duties of which position he carried out with efficiency and a fine dignity. During his year of office the University conferred on him the honorary degree of LL.D.

JOHN WATTERSON MILLER, M.D. Liverp., D.P.H.

Dr. John Miller, the medical officer of health for Radnorshire, died at his home at Llandrindod Wells on June 19th at the age of 62. He was born at Liverpool and educated at Liverpool College and the University of Liverpool, qualifying in 1899 and graduating M.D. both at Liverpool and in the Victoria University. In the South African War he was a civil surgeon with the field force and after taking his D.P.H. in 1901 he worked at the government plague research laboratories at Bombay and wrote a thesis and other papers on the dissemination and prevention of plague. On his return home he held public health appointments under the West Riding county council and at Blackburn, and from 1908 to 1921 was medical officer of health of Hereford. In 1921 he was appointed county medical officer of health and school medical officer for Radnorshire, and there he has interested himself especially in the problems of tuberculosis and of antenatal care as they affect rural areas. Dr. Miller was a barrister of the Middle Temple and in recent years has been medical adviser to the Mental Deficiency Act Commission, holding office for a term as president of the Welsh branch of the Society of Medical Officers of Health.

CHARLTON ROBERT FREDERICK HALL, B.Chir. Camb.

Dr. Charlton Hall, who died at his home at Norwich on June 7th at the age of 60, had been connected with the Norwich City Mental Hospital, first as assistant medical officer and then as medical superintendent, for twenty years, and the hospital owes much to his experience and skill. He was a Lancashire man and was educated at Birkenhead School and Trinity College, Cambridge. After leaving Cambridge he went to the London Hospital where he qualified in 1905, and then was in general practice at Shrewton in Wiltshire for some years. A serious operation kept him from active service and during the war he was assistant medical officer at the Shropshire Mental Hospital. He was appointed to the Norwich Mental Hospital in 1918 and became medical superintendent in 1935.

Charlton Hall was a strong supporter of the voluntary boarder system and believed in allowing mental patients as much liberty as possible. During his years at Norwich he did much to remove the asylum atmosphere at the hospital and he has had great success in his administration of the admission hospital opened at Drayton in 1935 by segregating early and voluntary cases from unsuitable companions. Dr. Hall excelled at all games; he was a tennis blue at Cambridge, played cricket and football at the hospital, and was a keen golfer and fisherman and a good shot. His charming voice and kindly smile were valuable assets in his work, and he had the respect and affection of his patients and staff.

In 1909 Dr. Hall married Jean Dickie Taylor and she survives him.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS

Road Accidents

ON June 17th in the House of Commons Mr. BURGIN, Minister of Transport, speaking on the vote for the Minister, said it was a melancholy fact that in spite of the ever-increasing attention given to the problem of road safety the aggregate figures of death and injury were appallingly high. It was impossible, humanly speaking, to attribute the cause of accidents to any one particular source. During the past year the Ministry had published the results of the biggest and most detailed investigation into these causes ever undertaken in any country. The investigation covered the twelve months ended March 31st, 1937, and analysed 200,000 accidents involving personal injury during that period. In the evidence now being given before the Select Committee on Road Accidents which had been appointed in the House of Lords he noted every witness emphasised the need for systematic and continued education of all classes of road users. The recommendations of the Inter-Departmental Committee on Road Safety as to education in road conduct and the setting up of children's safety committees had been carried out by 206 out of 315 education authorities in England and Wales. Eight accident officers were appointed at the end of 1936, one attached to each divisional road engineer in his area. Their reports confirmed that the greatest cause of accidents was human error in the form of carelessness or lack of consideration. The Transport Advisory Council, which had been examining the problem of the growing number of accidents to pedal cyclists, have now made a number of recommendations, including the building of cycle tracks and making such tracks compulsory; the carrying of a rear light and a small disc with the name and address of the owner; an obligation to report accidents; prohibition of riding more than two abreast except under special authorisation; proper brakes, and a restriction on careless driving. The total number of licensed motor-drivers in 1937 was approaching 4,000,000. Some 800,000 drivers had now passed the driving test. The proportion of failures was 37 per cent.—36 per cent. in men and 41 per cent. in women.—Mr. T. JOHNSTON said it was

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long past the stage of argument whether the alcoholic driver was a mere hypothetical contributory cause of accidents on the roads. The Ministry of Transport had asked a committee of the British Medical Association to inquire into the matter in July, 1935, and they had reported unanimously that the driving of a motor-car involved a series of highly skilled muscular movements which were dependent on rapid and accurate coördination between eyes, hands, and feet. The Minister had also received recommendations from some of the chief magistrates. Mr. Dummett, the chief metropolitan magistrate, said less than a year ago that a very large proportion of accidents were due to bad driving by drunken or semi-drunken drivers. The Minister and the House would have sooner or later to face up to the fact that no man should be permitted to be in charge of a motor-car on the road if he had taken alcohol.—Captain A. HUDSON, Parliamentary Secretary to the Ministry of Transport, said that everyone agreed that the drunken driver was a menace and should be kept off the roads, but the Ministry's statistics did not show that a great proportion of accidents occurred from the use of alcohol.

In the House of Lords on June 20th the Children and Young Persons Bill and the Baking Industry (Hours of Work) Bill passed through committee. The Food and Drugs Bill was agreed to on Report and the Prevention of Blindness (Scotland) Bill was read the third time and passed.

In the House of Commons on June 16th the Mental Deficiency Bill was read the third time and passed.

On June 20th in the House of Commons the Nursing Homes Registration (Scotland) Bill and the Infanticide Bill were read the third time and passed.

QUESTION TIME

WEDNESDAY, JUNE 15TH

National Fitness Campaign

Mr. LECKIE asked the Parliamentary Secretary to the Board of Education whether he was aware of the inadequate progress being made by the National Fitness Council working through the organisation which had been set up to carry on its administrative work; whether he would now consider an alternative method by handing over to the local education authority in each area the powers now committed to the county committees, as with their local knowledge the local education authorities would be able to deal more effectively and promptly with local requirements than the present administrators.—Mr. KENNETH LINDSAY replied: The answer to the first part of the question is in the negative, and my noble friend accordingly sees no occasion for introducing the legislation that would be necessary to carry into effect the suggestion made in the second part. The existing powers of local education authorities are already such as to enable them to make a very substantial contribution to the national fitness movement.

Hospitals and Air-raids

Colonel NATHAN asked the Home Secretary (1) the terms of reference to the committee appointed to inquire into certain questions relating to hospitals in the event of air-raids, and (2) whether he would consider appointing, as additions to the committee inquiring into certain questions relating to hospitals in the event of air-raids, some person with experience as a member of the lay committee of the voluntary hospitals, and some person with experience as secretary, or similar executive officer, of voluntary hospitals.—Mr. GEOFFREY LLOYD, Under-Secretary, Home Office, replied: My right hon. friend did not formally appoint a committee to make a report on the organisation of casualty hospitals, but invited a small number of eminent persons in the medical world to consider the proposals which had been worked out by the Departments and to make recommendations to him on various matters. It was understood that this body could take into consultation anyone likely to be able to help them and it was suggested that persons representing voluntary hospitals in the London area should be invited to take part in their deliberations. The Minister of Health is taking over the supervision of the organisation of war hospitals, and I understand he has issued an invitation on the lines suggested.

Health of Abyssinian Refugees in Kenya

Mr. GRAHAM WHITE asked the Secretary of State for the Colonies if he had received any further report of the condition of the Abyssinian refugees in Kenya.—Mr. MALCOLM MACDONALD replied: The Governor of Kenya has recently reported that the general health of the Abyssinian refugees continues to improve, and that, as a result of a regular milk ration provided from donations from the Abyssinian Refugees Relief Fund, the progress made by the children has been particularly marked. There was an epidemic of malaria in the early part of this year, mainly attributable to a recurrence of previous infections. But a complete antimalarial scheme has been undertaken and the incidence of the disease has now declined.

THURSDAY, JUNE 16TH

Day Nurseries in Liverpool

Mr. KIRBY asked the Minister of Health whether he had received any complaints as to the suggested closing of day nurseries in the city of Liverpool, in view of the fact that the city council had decided to close four day nurseries; whether he was aware that such action was widely deplored and would lead to the mothers of the children affected having to relinquish necessary wage-earning employment in order to care for their children at home; and, to avoid causing these mothers to seek public assistance, would he take steps to investigate fully proposals to reduce the number of day nurseries in Liverpool.—Mr. ELLIOT replied: I have, as previously stated, received two complaints in this matter, and have requested the council to reconsider their decision. I am at present awaiting the result of their reconsideration.

Aid for Voluntary Hospitals

Mr. DAVID ADAMS asked the Minister of Health whether a report would soon be forthcoming from the committee which was formed to consider the recommendations of the report of the Voluntary Hospitals Commission, 1937.—Mr. ELLIOT replied: I understand that a Provisional Central Council has been set up by the British Hospitals Association to consider the best methods of implementing the main recommendations of the report of the Voluntary Hospitals Commission. According to my information the Council is likely to issue a report towards the end of this year.—Mr. MAXTON: Is the Minister of Health proposing to leave all this entirely to voluntary organisations?—Mr. ELLIOT: I think we had better await the report.

Electrical Treatment of Rheumatism

Mr. DAVID ADAMS asked the Minister of Health whether he would take steps to place electrical treatment at the disposal of rheumatic patients under national health insurance since this treatment, of proved beneficial effect in a disease occasioning great annual loss in this country, was not now available to panel patients.—Mr. ELLIOT replied: The medical benefit to which insured persons are entitled as a statutory benefit is limited to services within the competence of general practitioners as a class and I have no power to extend the scope of the benefit. A number of approved societies, however, have made provision by way of additional benefits for the electrical treatment in approved institutions of their members suffering from rheumatism.

Analgesia at Childbirth

Dr. SUMMERSKILL asked the Minister of Health whether his attention had been drawn to the recent conference of 7000 delegates from women's institutes at the Albert Hall, at which it was agreed by an overwhelming majority that analgesia at childbirth should be available for all mothers who desired it; and whether he would set up an inquiry with a view to steps being taken which would meet the demand of these mothers.—Mr. ELLIOT replied: When a

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doctor is in charge of a case, the question of the administration of analgesics is, of course, within his discretion. As regards births attended by a midwife, the Central Midwives Board, which is the statutory authority regulating the practice of midwives, has resolved, following a report by the British College of Obstetricians, that midwives who have received suitable instruction may, with adequate safeguards, themselves administer analgesics. I am advised that it is within the powers of local authorities to provide the necessary apparatus as part of the equipment of the midwives whom they employ under the Act of 1936.

Medical Officers in R.A.F. Recruiting Depôts

Mr. DENVILLE asked the Secretary of State for Air if, in view of the importance of the subject, he would give his immediate consideration to the complaint of medical officers attached to the Royal Air Force recruiting depôts of the insufficiency of their remuneration and of the insecurity of their engagement.—Captain BALFOUR, Under-Secretary for Air, replied: Consideration has been given to the representations made by the officers referred to but it has not been possible to modify their conditions of employment.

Mental Defectives on Licence

Mr. LECKIE asked the Minister of Health the number of certified mental defectives on licence from institutions in England and Wales on Jan. 1st, 1937, and Jan. 1st, 1938, and the local authority to whom chargeable.—Mr. ELLIOT replied: The number of certified mental defectives on licence from institutions in England and Wales was 3023 on Jan. 1st, 1937, and 3155 on Jan. 1st, 1938. I will send my hon. friend a statement showing the local authorities to whom these defectives were chargeable.

Registrar-General's Vital Statistics

Captain ELLISTON asked the Minister of Health if his attention had been drawn to the belated publication of annual health reports; and whether he could arrange for earlier issue by the Registrar-General of the local vital statistics required by medical officers of health for the completion of such reports.—Mr. ELLIOT replied: I can assure my hon. friend that every effort will be made to secure the completion and distribution of these statistics to medical officers of health at the earliest possible date.

MONDAY, JUNE 20TH

Illegal Drug Traffic in China

Lieut.-Commander FLETCHER asked the Prime Minister if he had considered the recent proceedings of the Opium Board at Geneva, and if he proposed to make any representations to the Japanese Government concerning the evidence there given that that Government was actively aiding and abetting illegal drug traffic in China.—Mr. BUTLER, Under-Secretary for Foreign Affairs, replied: I have seen press reports of the allegations made against the Japanese Government before the Opium Advisory Committee at Geneva, but as I have not yet received any official account of the proceedings, I am unable to state what action, if any, it would be proper for H.M. Government to take in this connexion. The question of representations to the Japanese Government is being given careful consideration by the departments concerned.

Sir ERNEST GRAHAM-LITTLE asked the Prime Minister whether his attention had been called to the Report of the League Opium Board of Geneva that a Japanese dope offensive in China is being vigorously carried on; and whether the Government would support the League of Nations in ensuring exposure and reprobation of this policy.—Mr. BUTLER: As regards the first part of the question, I would refer the hon. Member to the answer which I gave to-day to Lieut-Commander Fletcher; as regards the second part, I can assure him that it is the definite policy of H.M. Government to give the fullest support in their power to the League of Nations in their efforts to expose and suppress the illicit drug traffic in the Far East.

Vaccine Experiments at Reims Island

Sir JOSEPH LEECH asked the Minister of Agriculture whether he was conferring with the Danish Government as to the results of the foot-and-mouth vaccine experiments at Reims Island; and whether H.M. Government was testing the efficacy of the vaccine.—Mr. MORRISON replied: I have seen reports on the active immunisation of animals against foot-and-mouth disease in Germany. In a preliminary scientific account that has been published, no details are given of the methods of preparation of the vaccine, but it is stated that they will be published in the near future. The results of the use of the vaccine in the field will also be published later. The Foot-and-Mouth Disease Research Committee is aware of the work which has been carried out in Denmark and its recent application in Germany, and is keeping in touch with the situation.

TUESDAY, JUNE 21ST

Paratyphoid Fever in Isle of Lewis

Mr. MALCOLM MACMILLAN asked the Secretary of State for Scotland whether any official report had been received by the Department of Health for Scotland regarding the outbreak of paratyphoid fever at Aignish, Isle of Lewis; whether full investigation regarding sources of infection had been or was being made; and whether he had any further statement to make in the matter.—Mr. WEDDERBURN, Under-Secretary of State for Scotland, replied: Yes, Sir, I understand that the investigation by the county medical authorities suggested that there was no common source of infection such as milk or water but indicated the possibility of the outbreak having arisen from the consumption by one of the patients of shell-fish on the seashore. The Department of Health were advised by the county medical officer on May 18th that there had been no fresh cases for three weeks, and that the outbreak might be regarded as over.—Mr. MACMILLAN asked whether, in view of the fact that about two months after the outbreak of the epidemic apparently no investigation had been undertaken and no report made, the Under-Secretary would explain at what time the investigation was actually made.—Mr. WEDDERBURN: The Department received from the medical officer on April 27th a report of the outbreak of paratyphoid. The first case was brought to the notice of the assistant medical officer of health for Stornoway on April 16th, and, according to the latest report, there had been no further cases since April 27th.

National Health Insurance in Scotland

Mr. BUCHANAN asked the Secretary of State for Scotland the number of persons covered by national health insurance who were approved with societies which had no additional benefits and the total of persons covered by national health insurance in Scotland.—Mr. WEDDERBURN replied: The total membership of approved societies which have their head offices in Scotland or have separate valuations for Scotland is 1,650,000. Of this number, 370,000 are members of societies which have no additional benefits.

PRINCESS MARY'S CONVALESCENT HOME, MARGATE. The first patients are already occupying this new convalescent home for women, which the London County Council has provided at Margate. The site of the home was previously occupied by Princess Mary's Hospital for Children, but in February, 1935, the Council decided to transfer the children to Heatherwood Hospital at Ascot. Patients will be sent to the Margate home on the recommendation of the medical superintendents of the Council's London hospitals. It stands in about four acres and has accommodation for 223 women and 14 babies. The work of reconstruction has cost over £76,000. One section of the ward accommodation will be used as a sick-bay for convalescent patients and the other for convalescent mothers with their infants. By the side of each bed there is a press-button bulb to enable the patient to call a nurse at any time. Earphone points are provided for all the beds and wireless loud-speakers have been installed in each of the day-rooms. There is also a recreation-room, 73 ft. long and 20 ft. wide, with a removable stage, two dressing-rooms, and a scenery-room. The home is equipped to give massage and electrical treatment.

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MEDICAL NEWS

University of Oxford

On July 30th the honorary degree of doctor of science will be conferred on Dr. C. G. Jung, professor of psychology at the Federal Polytechnical University, Zürich.

University of Bristol

At recent examinations the following candidates were successful :—

FINAL EXAMINATION FOR M.B., CH.B.

Section II.—*Kathleen E. Byrt, K. J. V. Carlson, Margaret H. Davies, Eileen M. D. Knox, G. R. E. Maxted, Margaret E. Morgan, *R. H. Owen, Mabel W. N. Tribe, and A. H. Wright.

In Group I.—W. H. G. Elliott and J. S. Richardson.

* With distinction in forensic medicine and toxicology.

B.D.S.

F. P. Ewens.

L.D.S.

F. S. S. Baguley, J. F. Durie, C. F. Howell, C. C. Moore, L. K. A. S. Oxley, D. M. Sanders, and R. V. Woods.

University of Manchester

Mr. A. R. Todd, D.Sc., has been appointed Sir Samuel Hall professor of chemistry and director of the chemical laboratories of the university in succession to Prof. I. M. Heilbronn who is retiring.

Dr. Todd graduated with first-class honours in chemistry at Glasgow in 1928, and after working at Frankfort and Oxford went to Edinburgh in 1934, to the department of chemistry in relation to medicine, with a grant from the Medical Research Council and later a Beit medical research fellowship. Here he worked on the chemistry of vitamin B_1 and related compounds and also on anthelmintics. In 1936 he was appointed to the department of biochemistry of the Lister Institute, where he followed up his synthesis of vitamin B_1 by synthesising a number of its analogues to determine the group essential for physiological activity.

Royal College of Surgeons of England

At the recent primary examination for the fellowship of the College the following candidates were successful :—

H. Abd-El-Aziz, M.B. Cairo, Middlesex; A. S. Aldis, M.B. Lond., Univ. Coll. and Middlesex; A. C. Begg, M.B. N.Z., Middlesex; B. R. Billimoria, M.R.C.S., St. Bart.'s; A. C. Bingold, London and Middlesex; R. Blunden, M.B. N.Z., Middlesex and Univ. Coll.; F. Braithwaite, M.B. Camb., St. Bart.'s and Univ. Coll.; M. L. Burman, M.B. Patna, Univ. Coll.; Maitreyee Chaudhuri, M.B. Punjab, Univ. Coll.; Joan Cleland, King's Coll.; J. C. Coates, M.B. Leeds; A. J. Craig, M.D. Malta, Univ. Coll.; H. J. Croot, M.B. Lond., Guy's; C. H. Cullen, M.B. Belf.; A. M. Desmond, M.B. Lond., London; F. P. Dewar, M.D. Toronto; N. J. Dhondy, M.B. Bombay, Univ. Coll.; Aileen M. Dickins, Univ. Coll.; E. P. H. Drake, M.B. Camb., St. Bart.'s; H. H. Eddey, M.B. Melb., Univ. Coll.; G. M. Foote, M.B. N.Z.; R. G. Ginde, M.B. Bombay, Univ. Coll.; J. D. Gray, M.B. Sheff., Middlesex; M. W. Hicks, M.D. Toronto; J. M. J. Jens, M.B. Adelaide; J. H. A. Jewell, M.B. Dubl., Middlesex; J. S. Joly, M.B. Camb., St. Bart.'s and Univ. Coll.; R. A. King, London and Middlesex; R. L. Lamming, M.B. Leeds; L. R. Leask, M.B. Lond., St. Bart.'s and Univ. Coll.; O. Lloyd, M.B. Lond., Middlesex; D. A. Lowe, M.B. Edin.; K. M. MacLeod, M.D. Cornell, Middlesex; J. E. Malcolm, M.B. St. And., Middlesex; N. S. Martin, M.B. Belf.; N. L. Mehta, M.B. Bombay, Middlesex; Eleanor M. Mills, M.B. Manch., Univ. Coll.; S. V. Modi, M.B. Bombay; R. A. Moir, King's Coll.; C. P. Nicholas, M.B. Birm., Middlesex; H. A. Oatley, M.B. Lond., Camb. and Univ. Coll.; R. Parkinson, M.B. Lond., London; D. S. Quill, M.B. Dubl., Manch; D. Ranger, Middlesex; W. S. Rees, M.B. Birm., Sheff.; J. P. Reidy, M.B. Camb., London and Middlesex; D. A. Richmond, M.B. Manch.; P. W. S. Riley, M.B. N.Z., Univ. Coll.; P. A. Robinson, M.R.C.S. Camb. and Middlesex; M. S. K. Rudd, M.D. Toronto, Univ. Coll.; C. A. R. Schulenburg, M.B. Cape Town, Univ. Coll.; H. K. Sett, M.B. Calcutta, Middlesex; F. A. Simmonds, M.R.C.S. Camb. and St. Thos.; J. Singh, M.B. Punjab, Middlesex; W. E. Spring, M.B. Melb., Middlesex; A. W. Stewart, M.R.C.S., London and Middlesex; J. Swinney, M.D. Durh.; L. R. S. Taylor, Camb. and St. Thos.; W. Thompson, Leeds; B. M. Truscott, M.B. Lond., Middlesex; A. K. Tulloch, M.B. N.Z., Univ. Coll.; and Carolina M. van Dorp, Roy. Free.

On Friday, July 1st, at 5 P.M., Mr. P. B. Ascroft will give his postponed Hunterian lecture. He will speak on the surgical treatment of arterial hypertension. On July 15th Prof. Frank Mann, director of the Mayo Foundation for Medical Education and Research of the University of Minnesota, will give a speciallect ure on the mechanism of peptic ulceration with a review of the results of experimental investigations. Both lectures will take place at the college, Lincoln's Inn-fields, at 5 P.M.

London Hospital

On Thursday, June 30th, at 3 P.M., Dr. Robert Hutchison, P.R.C.P., will present the prizes to the students of this hospital.

Moynihan Fellowship

The Association of Surgeons of Great Britain and Ireland invite applications for this fellowship which may be held for one year and is worth £350. Further information will be found in our advertisement columns.

West London Medico-Chirurgical Society

The fifty-sixth annual dinner of this society will take place at the Trocadero Restaurant, W., on Wednesday, July 6th, at 8 P.M. Lord Dawson will afterwards present the triennial medal to Prof. E. C. Dodds, and Lord Macmillan will propose the health of the Society. Other guests of honour will include Dr. Robert Hutchison, Sir Farquhar Buzzard, and Sir Frederick Menzies. Further information may be had from the hon. secretaries, 77, Harley-street, W.

Sanitary Inspectors' Association

Sir Leonard Hill, F.R.S., will preside at the fifty-first annual conference of the association which is to be held at Edinburgh from Sept. 5th to 10th. Subjects for discussion will include shell-fish, inspection of meat, laboratory control of milk-supplies, food and drugs legislation, housing, sanitation, atmospheric pollution, and the disposal of trade effluents. A symposium comparing English and Scottish sanitary practice is also on the agenda. Further information may be had from the secretary, 19, Grosvenor-place, London, S.W.1.

Association of Clinical Pathologists

The summer meeting of this association will be held to-morrow, Saturday, June 25th, at Oxford. At 9 A.M., in the pathology department of the Radcliffe Infirmary, Dr. J. G. Greenfield will demonstrate the removal of brain and cord, Dr. A. G. Shera an electrical rotary saw for use in post-mortem work, and Dr. A. H. T. Robb-Smith the technique of exposure of accessory air sinuses. Later, in the Nuffield Institute, Sir Bernard Spilsbury will open a discussion on the technique of the medico-legal post-mortem, and Dr. Robb-Smith will describe uses of fresh preparations in post-mortem work. Dr. Eric Wordley will speak on status lymphaticus and a discussion will follow.

Royal Sanitary Institute

The annual health congress of this institute will take place at Portsmouth from July 11th to 16th under the presidency of Lord Bessborough. The work of the congress will be divided into seven sections, and conferences of representatives of local authorities, of medical officers of health, of engineers and surveyors, of sanitary inspectors, and of health visitors will be held in connexion with it. In the section of preventive medicine Dr. Veitch Clark will be one of the speakers in a discussion on the future of the general hospital. Sir Malcolm Watson has chosen health propaganda among indigenous races in the tropics as the subject of his presidential address to the section of tropical hygiene, and Dr. H. S. de Boer and Dr. A. R. Paterson will speak in the discussion which will follow. In the section of maternity, child welfare, and school hygiene Dr. J. Greenwood Wilson, Mr. Myles Formby, and Major-General J. B. Helliwell will take part in a discussion on the defects found in school entrants and the steps that might be taken to effect their remedy before the beginning of school life. Dr. James Fenton will preside over the conference of medical officers of health and Lord Horder, Dr. J. Alison Glover, and Dr. H. J. Rae will open a discussion on rheumatism. Dr. Grace Calver and Dr. Mildred Creak will speak to the conference of health visitors on behaviour and nervous disorders in children attending maternity and child welfare centres. Further information may be had from the offices of the institute, 90, Buckingham Palace-road, London, S.W.1.

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National Hospital, Queen-square

Queen Mary will open the new wing of this hospital on July 19th at 3 P.M.

The out-patient department will be closed from July 11th to 19th inclusive.

Medical Vacation Course at Frankfort

A vacation course for qualified doctors and advanced students has been arranged by the Mayor of Frankfort-on-Maine and the dean of the faculty of medicine of the university. The National Union of Students hope to collect a party from hospitals and medical schools all over the British Isles to attend it. Further information may be had from their travel department, 3, Endsleigh-street, London, W.C.1.

Lady Tata Memorial Grants and Scholarships

The trustees of this fund have awarded the following grants and scholarships for research in blood diseases with special reference to leukæmia :—

Grants for research expenses or for scientific assistance.—Dr. Julius Engelbreth-Holm (Copenhagen), Dr. M. P. J. Guérin (Paris), Prof. Karl Jármai (Budapest), Prof. James McIntosh (London), Prof. Eugene Opie and Dr. J. Furth (New York), Dr. Georg Weitzmann (Leipzig), and Dr. Joachim Wienbeck (Breslau).

Whole-time scholarships.—Dr. Jørgen Bichel (Aarhus, Denmark) and Dr. Edoardo Storti (Pavia, Italy).

Part-time scholarship.—Dr. Werner Jacobson (Cambridge).

Voluntary Aid Detachments

A total of 167 men's detachments and 1138 women's detachments, with a membership of 33,616, have now been recognised by the War Office. Since last November there has been an increase of 11 men's detachments and 41 women's detachments, representing an increased membership of 1395. The present scheme was inaugurated in 1923 and is designed to supplement the medical services of the naval, military, and air forces in time of war. "Mobile" members, of whom there are now 1110 men and 5910 women, give an undertaking that in the event of the embodiment of the Territorial Army they will serve either at home or abroad.

National Conference on Maternity and Child Welfare

This conference will be held on July 5th, 6th, and 7th in Bristol under the presidency of Mr. R. H. Bernays, M.P., parliamentary secretary to the Ministry of Health. At the first session Prof. H. J. Drew Smythe and Dr. Eleanor Partridge will open a discussion on the psychology of pregnancy in conjunction with the falling birth-rate. In the afternoon Mr. R. C. Elmslie and Mr. John Bastow will speak on physical fitness in young children. The morning session of the second day will be devoted to a discussion of the need for closer coöperation between the school medical and maternity and child welfare services, and the need for increased provision of convalescent residential accommodation for children under school age. The speakers will include Dr. A. S. M. Macgregor, Dr. R. H. Parry, Dr. Wilfred Pearson, and Dr. Ronald Cove-Smith. Dr. G. F. McCleary and Dr. Maitland Radford are the speakers at the last session of the conference and their subject will be twenty years of child welfare work—retrospect and prospect. Further particulars may be had from the offices of the National Association of Maternity and Child Welfare Centres, Carnegie House, 117, Piccadilly, London, W.

Appointments

BIRDSALL, S. E., B.Chir. Camb., F.R.C.S. Eng., Hon. Assistant Surgeon to the Throat, Nose, and Ear Hospital, Golden-square.

BROOKS, W. D. W., B.M. Oxon., M.R.C.P. Lond., Assistant Physician to the Hospital for Consumption, Brompton.

ELDER, C. L., M.B. Glasg., B.Hy. Durh., D.P.H., Assistant Medical Officer of Health for Bury.

FOSTER-CARTER, A. F., B.M. Oxon., Resident Medical Officer at the Hospital for Consumption, Brompton.

KENDALL, DAVID, B.M. Oxon., M.R.C.P. Lond., House Physician at the National Hospital, Queen-square.

WILLIAMS, D. J., M.D. Manch., M.R.C.P. Lond., Registrar at the National Hospital, Queen-square.

WISHART, G. N. M., M.R.C.S. Eng., Resident Medical Officer at the Royal Manchester Children's Hospital, Pendlebury.

Medical Referee under the Workmen's Compensation Act, 1925, Dr. JOHN FINDLAY, of Westcliff-on-Sea, for the Southend and Grays Thurrock County Court Districts (Circuit No. 58).

Vacancies

For further information refer to the advertisement columns

Army Dental Corps.—Dental Surgeons.
Ashton-under-Lyne District Infirmary.—Res. Surg. O., Cas. H.S., and H.S., at rate of £200, £180, and £150 respectively.
Association of Surgeons of Great Britain and Ireland, 50, Wimpole-street, W.—Moynihan Fellowship, £350.
Aylesbury, Royal Buckinghamshire Hosp.—Jun. Res. M.O., at rate of £150.
Bath, Royal United Hosp.—Hon. Asst. Dermatologist. Hon. Physician for Mental Diseases. Also Hon. Med. Reg.
Battersea General Hosp., S.W.—H.P. and H.S., each £130.
Belfast, Queen's University.—Lectureship in Physiology, £600.
Birmingham City, Maternity and Child Welfare Dept.—Two M.O.'s, each £500.
Birmingham, Dudley-road Hosp.—Jun. M.O., at rate of £200.
Birmingham Maternity Hosp.—H.S., at rate of £75.
Birmingham and Midland Eye Hosp.—H.S., at rate of £130.
Birmingham, City Mental Hosp.—Med. Supt., Winson Green Division, £1100.
Bolingbroke Hosp., Wandsworth Common, S.W.—Hon. Phys.
Bolton Royal Infirmary.—H.S., £150.
Bradford Children's Hosp.—H.S., £150.
Bradford Royal Infirmary.—Res. Surg. O., £250. Also Asst. Radium Officer, £175.
Brighton, Sussex Maternity and Women's Hosp.—Hon. Obstet. and Gynæcological Surgeon.
Burton-on-Trent General Infirmary.—Cas. O. and H.P., £150.
Cambridge, Addenbrooke's Hosp.—H.S. and H.P., each at rate of £130.
Carlisle, Cumberland Infirmary.—Hon. Asst. Surg.
Charing Cross Hosp., W.C.—Hon. Clin. Asst. in X Ray and Electrotherapeutics Dept.
Cheshire, Bredbury and Romiley Urban District Council, &c.—M.O.H., £800.
Cheshire, Cleaver Sanatorium for Children, Heswall.—Res. Asst. M.O., £300.
Chesterfield and North Derbyshire Royal Hosp.—H.S. to Ophth., &c., Dept., at rate of £150.
Colchester, Essex County Hosp.—Asst. H.S., £120.
Connaught Hosp., Walthamstow, E.—Cas. O., at rate of £110.
Coventry and Warwickshire Hosp.—H.S., at rate of £150. Also Cas. O., at rate of £150–£250.
Coventry City.—Asst. School M.O., &c., £500.
Croydon General Hosp.—H.S., £125.
Deal, Victoria Hosp.—Res. M.O., at rate of £150.
Dewsbury and District General Infirmary.—Sen. H.S. and Second H.S., £200 and £150 respectively.
Dover, Royal Victoria Hosp.—H.P., at rate of £120.
Ealing Borough.—Asst. M.O., £450.
East Ham Memorial Hosp., Shrewsbury-road, E.—Hon. Gynæcologist.
Edinburgh, Western General Hosp.—Resident Anæsthetist, £150.
Gloucestershire Royal Infirmary, &c.—Cas. O., H.P., and two H.S.'s, each at rate of £150.
Golden-square Throat, Nose, and Ear Hosp., W.—Registrar.
Guildford, Royal Surrey County Hosp.—H.S., at rate of £150.
Hampstead General Hosp., Haverstock Hill, N.W.—Surg. to Out-patients.
Hertford County Hosp.—H.S., at rate of £200.
Hosp. for Consumption and Diseases of the Chest, Brompton, S.W.—H.P., at rate of £50.
Hosp. of St. John and St. Elizabeth, 60, Grove End-road, N.W.—Res. H.P., at rate of £100.
Hull Royal Infirmary.—Second Cas. O., at rate of £150.
Ilford, King George Hosp.—Med. Reg., £150. Also H.S., at rate of £100.
Indian Medical Service.—Commissions.
Ipswich, East Suffolk and Ipswich Hosp.—H.S., £144.
Isleworth, West Middlesex County Hosp.—Res. Asst. M.O. (Surgical), £400.
Khartoum, Stack Medical Research Laboratories.—Jun. Lab. Asst., £E.324.
Kidderminster and District General Hosp.—Jun. H.S., £100.
Lancaster County Mental Hosp.—Asst. M.O., £550.
London County Council.—Asst. M.O.'s, Grade I and II, £350 and £250 respectively. Also Part-time Ear, Nose, and Throat Specialist, £125, &c.
Manchester, Christie Hosp. and Holt Radium Institute, Withington.—Res. Surg. O., at rate of £150.
Manchester Royal Children's Hosp.—Res. H.S., at rate of £100.
Manchester Royal Infirmary.—Jun. Asst. M.O. in Radiological Dept., at rate of £350. Also Res. Surg. O., £200.
Middlesbrough, North Riding Infirmary.—Third H.S. and Cas. O., at rate of £150 and £140 respectively.
Middlesex County Council.—Asst. M.O. in P.H. and School Med. Dept., £600.
Newcastle General Hosp.—Med. Reg. and Surg. Reg., each £250. Also two H.S.'s and H.P., each at rate of £150.
Newcastle-on-Tyne Babies' Hosp.—M.O., at rate of £150.
Northamptonshire County Council.—Asst. County M.O., &c., £800.
Norwich City Mental Hosp.—Med. Supt., £1000.
Norwich, Norfolk and Norwich Hosp.—H.S., £120.
Nottingham General Hosp.—H.S., at rate of £150.
Nottingham Isolation Hosp., Hucknall-road.—Res. M.O., at rate of £250.
Oxford, Wingfield-Morris Orthopædic Hosp.—Res. H.S., at rate of £100–£120.
Pembroke County War Memorial Hosp., Haverfordwest.—Res. H.S., £200.
Portsmouth, St. Mary's Municipal Hosp.—Sen. and Jun. Asst. Res. M.O., £350 and £250 respectively.

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Preston and County of Lancaster, Queen Victoria Royal Infirmary.—H.P., and H.S. to Eye, Ear, &c., Dept., each at rate of £150.
Princess Elizabeth of York Hosp. for Children, Shadwell, E.—Asst. Surgeon.
Princess Louise Kensington Hosp. for Children, N. Kensington, W.—Hon. Asst. Phys., &c.
Radium Institute, Riding House-street, W.—Res. M.O., at rate of £250.
Reading, Royal Berkshire Hosp.—Cas. O., at rate of £150. Also Surgical Reg.
Rhondda Urban District Council.—Asst M.O., £500.
Rochdale Infirmary and Dispensary.—Second H.S., £150.
Rotherham Hosp.—Cas. H.S., £150.
Royal Air Force—M.O.'s.
Royal Chest Hosp., City-road, E.C.—H.P., at rate of £100.
Royal Free Hosp. and London School of Medicine for Women, W.C.—Second Asst. to Obstet. and Gyn. Unit, at rate of £500.
Royal London Ophthalmic Hosp., City-road, E.C.—Two Out-patient Officers, each £100.
Royal Naval Dental Service.—Dental Officers.
Royal Naval Medical Service.—M.O.'s.
Royal Northern Hosp., Holloway, N.—Ophth. Reg., £50.
Runwell Hosp. for Nervous and Mental Disorders, near Wickford.—H.P., at rate of £150.
St. George's Hosp., S.W.—H.S. to Ear, Nose, and Throat and Ophth. Depts., at rate of £40.
St. Helens Hosp., Lancs.—Sen. H.S., £225.
St. Mary's Hosp. for Women and Children, Plaistow, E.—Res. Surg. O., at rate of £155.
St. Pancras Dispensary, 39, Oakley-square, N.W.—Hon. Gynæcologist.
St. Peter's Hosp. for Stone &c., Henrietta-street, W.C.—H.S., at rate of £75.
Salford City Infectious Diseases Hosp.—Jun. Asst. Res. M.O, £200.
Salop County Council.—Deputy County M.O.H. and Asst. M.O.H., £700 and £600 respectively.
Sheffield Royal Infirmary.—Asst. Pathologist and Clin. Asst. to Ophth. Dept., each £300.
Southend-on-Sea General Hosp.—Res. Anæsthetist and First H.S., at rate of £125 and £100 respectively.
Stamford, Rutland and General Infirmary.—H.S., at rate of £250.
Stoke-on-Trent, Longton Hosp.—H.S., £180–£200.
University College Hosp. Medical School, W.C.—John Marshall Fellowship, £500.
Wakefield, Clayton Hosp.—Three H.S.'s, each at rate of £200.
Walsall General Hosp.—H.S., at rate of £150.
West Bromwich, Hallam Hosp.—Res. Obstet. Officer, £300. Also Res. Asst. M.O., at rate of £200.
West Sussex County Council.—Asst. County M.O.H., &c., £800.
Westminster Hosp., Broad Sanctuary, S.W.—Asst. H.S., at rate of £52.
Worthing Hosp.—H.S., at rate of £130.
York Dispensary.—Res. M.O., £175.
York, The Retreat.—Med. Supt., £1000.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Framlingham (Suffolk), Stillington (Durham), Yealmpton (Devon), District of Arisaig and Moidart (No. 1) (Inverness), and Brierley Hill (Stafford).

Medical Diary

June 27th to July 2nd

SOCIETIES

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, Manson House, 26, Portland-place, W.

THURSDAY.—8.15 P.M., annual general meeting. 8.30 P.M., Dr. N. Hamilton Fairley (in collaboration with R. J. Bromfield, Henry Foy, and Athena Kondi): Hæmolytic Macrocytic Anæmia in Macedonia—a Malaria-Deficiency Syndrome. Dr. Lucy Wills will also speak.

NATIONAL ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS.

THURSDAY.—10 A.M. (B.M.A. House, Tavistock-square, W.C.), Mr. Walter Elliot: Inaugural address. Dr. G. Lissant Cox: The Development and Organisation of Anti-tuberculosis Activities in Rural Areas. Dr. A. M. Fraser and Dr. V. Emrys Jones will also speak.—2 P.M., Dr. G. T. Hebert: The Family and Tuberculosis—the Discovery and Protection of Contacts in a Tuberculous Household. Dr. G. S. Banks and Dr. C. H. C. Toussaint will also speak.

FRIDAY.—10.30 A.M., Prof. S. Lyle Cummins: The Control of Tuberculosis in Tropical and Sub-tropical Regions. Dr. C. Wilcocks, Dr. E. Cochrane, Major-General E. W. C. Bradfield, and Dr. N. D. Bardswell will also speak.—2.30 P.M., Dr. J. R. Rees and Dr. A. A. W. Petrie: The Mental Aspects of Tuberculosis. Dr. A. J. Morland and Dr. J. Brander will also speak.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn-fields, W.C.

MONDAY and WEDNESDAY.—5 P.M., Dr. John Beattie: Recent Work in Experimental Surgery. (Arris and Gale lectures.)

FRIDAY.—5 P.M., Mr. P. B. Ascroft: The Surgical Treatment of Arterial Hypertension. (Hunterian lecture.)

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane-road, W.

MONDAY.—4.30 P.M., Dr. E. Sharpey-Schafer: Diseases of the Ductless Glands.

TUESDAY.—4.30 P.M., Dr. J. S. Anderson: Modern Methods in Diagnosis and Treatment of (*a*) Diphtheria, (*b*) Scarlet Fever.

WEDNESDAY.—Noon, clinical and pathological conference (medical). 3 P.M., clinical and pathological conference (surgical). 4.30 P.M., Prof. J. C. Drummond, D.Sc.: Practical Aspects of Modern Vitamin Research.

THURSDAY.—2.15 P.M., Dr. Duncan White: radiological demonstration.

FRIDAY.—2 P.M., clinical and pathological conference (obstetrics and gynæcology). 2.30 P.M., Mr. E. Rock Carling: Surgery of the Spleen.

Daily, 10 A.M. to 4 P.M., medical clinics, surgical clinics and operations, obstetrical and gynæcological clinics and operations.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.

THURSDAY.—2 P.M., Dr. Donald Paterson: Persistent and Recurrent Pyrexia. 3 P.M., Dr. W. W. Payne: Demonstration on the Uses of Erythrocyte Sedimentation-rate.

Out-patient clinics daily at 10 A.M. and ward visits at 2 P.M.

ST. GEORGE'S HOSPITAL, S.W.

MONDAY.—5 P.M., Sir Frederick Hobday: Comparative Medicine.

THURSDAY.—5 P.M., Dr. Alfred Meyer: psychiatric demonstration.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY to SATURDAY.—PRINCE OF WALES GENERAL HOSPITAL, Tottenham, N., all-day course in medicine, surgery, and the specialties.—PRESTON HALL, near Maidstone, Kent. Sat., all-day demonstration on pulmonary tuberculosis.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James' Hospital, Ouseley-road, S.W.

WEDNESDAY.—4 P.M., Mr. J. Howell Evans: Wherein Does Cancer Lie?

Births, Marriages, and Deaths

BIRTHS

EDWARDS.—On June 19th, at Devonshire-place, the wife of Dr. John A. Edwards, Colnbrook, Bucks—a daughter.

EVANS.—On June 15th, at Bentinck-street, the wife of Dr. Courtenay Evans—a son.

MACKINNON.—On June 15th, the wife of Dr. Alastair U. MacKinnon, Leeds—a daughter.

SHEARER.—On June 16th, at Nuffield House, Guy's Hospital, the wife of Dr. Gavin Shearer, Colonial Medical Service, Nigeria—a son.

VERE NICOLL.—On June 17th, at Bangalore, India, the wife of Captain J. A. Vere Nicoll, R.A.M.C.—a daughter.

WINCKWORTH.—On June 13th, at Taunton, the wife of Mr. R. F. Winckworth, F.R.C.S.—a daughter.

MARRIAGES

CHALMERS WATSON—ASCHE.—On June 15th, at the Register Office, Marylebone Town Hall, D. Chalmers Watson, M.D. Edin., to Elizabeth Asche (Lily Brayton).

SMALL—MCCONNELL.—On June 16th, 1938, at the Presbyterian Church, Helen's Bay, Northern Ireland, Dr. James Alexander Small, Heigham Hall, Norwich, to Dr. Doris Kathleen McConnell, Bangor, Co. Down.

TULLOH—PENNY.—On June 15th, at Bromley, Kent, Ernest Peter Tulloh, M.B. Durh., D.O.M.S., to Eileen Margaret Penny.

DIAMOND WEDDING

DOUGLAS—PEREGRINE.—On June 19th, 1878, at the Parish Church, Silchester, Hants, Claude Douglas, F.R.C.S. Eng., of Leicester, to Louisa Bolitho, youngest daughter of Thomas Peregrine, M.D. Present address: 15, Marston Ferry-road, Oxford.

DEATHS

HUDSON.—On June 19th, at Bedlington, Northumberland, William Hudson, M.D. Durh., D.P.H., aged 54.

MILLER.—On June 19th, at Llandrindod Wells, John Watterson Miller, M.D. Vict., Barrister-at-Law.

RUTHERFORD.—On June 18th, at Newcastle-on-Tyne, John Victor Walton Rutherford, M.B. Edin., Lieut.-Colonel, R.A.M.C., of Paramé, France, in his 82nd year.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

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NOTES, COMMENTS, AND ABSTRACTS

A SURVEY OF HOUSING PROBLEMS

MOST of us have heard of the Karl Marx Hof, and some perhaps have glimpsed from their aeroplane the curious towers of Drancy, but few have an intimate knowledge of European working-class housing. The outcome of expert study is now to hand. After several years as secretary to a public utility housing society in London Miss Denby has recently spent a year on the Continent as Leverhulme research fellow, investigating low-rented housing estates, and her survey[1] is thus entitled, as Lord Horder points out in his foreword, to close attention. She classifies the countries under review by their status after the war; and from the study of two winners, two losers, and two neutrals concludes that there is no necessary connexion between national wealth and success in building houses for families with low incomes. Vienna, despite her poverty, produced a scheme which, taken as a whole, Miss Denby thinks ranks higher than any other, while it is the main thesis of the book that England, spending far more per dwelling, has got less value for her money than any other country. Vienna, for example, had been able by 1931 to build 111 nursery schools containing 9600 children; in London in 1938 there are 26, with 1162 children. The Viennese achievement was made possible by the elimination of profiteering in building materials and by the collapse of land values which enabled the municipality to buy land cheaply. In England it is on building materials and expensive compensation that the bulk of our money has gone. France also has had to spend heavily on compensation, with the result that she is behind-hand with slum clearance; against this must however be set the imaginative new garden cities round Paris, which are in the front rank of modern housing work. From France also comes the most up-to-date method of refuse disposal, the Garchy system. In Italy and Germany it is interesting to note the effect of politics on housing. Social centres are not provided in the new schemes, and in Germany the Nazi emphasis on the family is apparently discouraging nursery schools. London might well envy Rome her plenary powers to clear slums and preserve beautiful buildings regardless of vested interests. We should expect to learn most from Holland and Sweden as they are nearest to us in climate and political structure, but the Dutch suffer from such shortage of space as to make their problem peculiar. We share Miss Denby's dislike of the Dutch system of segregation of undesirables; the estates are quite attractive, but people not unnaturally prefer "a good address." Sweden is held up as the model we could most easily imitate. Private enterprise is given scope, but central planning and control prevent our own often chaotic results. In comparing British estates unfavourably with continental ones Miss Denby does not give sufficient credit to the new British interiors. It is after all something to have a bathroom to each family and an outside window to a w.c. She is also on uncertain ground when she stigmatises as lazy the policy of building satellite towns. It is true that our slums are more horizontal than vertical, and that replanning at the centre should therefore be easier for us than for continental towns which were intensively developed in tenement blocks before the war; true also that we could with advantage economise on road space, and that our spreading development will look foolish in fifty years' time if the predicted decline in population takes place. But attractive as the scheme of cottages at 30 to the acre in the centre of the town may be, it cannot be carried out under the present system of private ownership of expensive urban land. It is to be hoped, however, that the builders of the satellite towns will take to heart the most necessary warning against repeating the dreary effect of our past "zoning snobberies," and will follow the example of Chatenay Malabry in providing dwellings for a wide range of income levels in one scheme. It is a pity that Russia was not included in the survey, and it would have been interesting to hear more of rural housing.

[1] Europe Rehoused. By Elizabeth Denby. London: George Allen and Unwin. Pp. 284. 14s.

PHYSICIAN AND APOTHECARY

IN ancient times the fellowship of London physicians supervised the sale of drugs by apothecaries. Had its régime survived, there might have been the less anxiety to-day over the unrestricted retailing of secret remedies. Those old days are recalled by certain proposed amendments to the Food and Drugs Bill. The Bill had already scheduled for repeal many existing laws which it is about to supersede and replace. Opportunity is evidently being taken to clear away also some early enactments which, though obsolete, are at present unrepealed. Thus it is proposed to get rid of part of an Act of Henry VIII (32 Henry VIII, Cap. 40, Section 2) whereby four of the best learned, wisest, and most discreet physicians were to be chosen annually for the inspection of apothecaries' premises, with authority to burn or otherwise destroy any wares found to be defective, corrupt, or not meet to be ministered in medicine for the health of men's bodies. Any apothecary who obstructed the search would forfeit £5; if the appointed four neglected their duty, they would be fined 40s. Thirteen years later came another enactment which the amended Bill now seeks also to repeal. Section 3 of an Act of Mary "touching thincorporations of the Phisitions in London" added that, for the better execution of the search, the wardens of the Grocers' Company should accompany the four inspecting physicians. In the same schedule of proposed repeals it is intended also to insert Sections 3 and 4 of the Apothecaries Act, 1815. These provisions authorised the Society of London Apothecaries to enter the shops of persons using the art or mystery of an apothecary in England or Wales and to search, survey, prove, and determine if the medicines, wares, and drugs therein were wholesome, meet, and fit for the health, ease, and cure of His Majesty's subjects. The society was to destroy any drugs found, in the pleonastic phraseology of the period "false, unlawful, deceitful, stale, unwholesome, corrupt, pernicious or hurtful." No one was to take part in this search in London or within a 30-mile radius unless he was a member of the society of ten years' standing, nor elsewhere in England and Wales unless he had ten years of actual practice as an apothecary. The Food and Drugs Bill, in its laudable effort to tidy up the law, has discovered these dead enactments and now takes the opportunity to give them formal burial.

It must be many generations since the censors of the Royal College of Physicians inspected apothecaries' shops—presumably not since the year 1858, at any rate. The Grocers' Company, it is believed, has not exercised its right of search under the Act of Mary

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since the year of the fire of London, though its charter of 1689 seems to concede or confirm the privilege of supervising and correcting druggists. The Society of Apothecaries has not been required to inspect and destroy defective medicines since the modern law of food and drugs has made it an offence to sell wares not of the nature and substance demanded by the purchaser. No vested interests, therefore, will suffer if these vestigial survivals disappear, though the national spirit of conservatism may regret the formal removal of any relic of times when life was simpler if more carefully supervised.

LIBRARIES FOR HOSPITALS

THE second conference of the International Guild of Hospital Librarians was held in Berne from June 7th to 11th. Delegates came from Belgium, Finland, France, Germany, Great Britain, Norway, and Switzerland. Three reports were presented by the British section of the Guild. Mrs. M. E. Roberts (hon. secretary) spoke on methods of establishing hospital libraries, and papers were sent by Mrs. Raymond on methods of collecting books and by Mrs. Beddington on the hospital librarian, her recruitment and status. Dr. Wyrsch also spoke on books and reading for mental patients. Dr. René Sand, the president of the Guild, at the end of his report announced that an invitation had been received to hold the next conference in London in 1940, and the delegates unanimously agreed to this.

On June 16th at Portsmouth, at the annual conference of the Library Association, the provision of libraries for patients through the county library authority was considered. Miss A. S. Cooke, the county librarian of Kent, spoke of the difficulties. In Surrey, for example, there are 86 hospitals, some for general cases, some for infectious cases, and some for mental cases. Again some are voluntary hospitals, some are under the Surrey county council, some under the London County Council, some under Croydon county borough, and so on. The supply and transport of books can usually be arranged, but in scattered country places the provision of adequate supervision is more difficult. Voluntary helpers can receive some training under professional direction at a central library, which can also supply the catalogue cards, but the visits of a county librarian or a member of the staff can only be occasional. Miss Gerard, the borough librarian of Worthing, described the arrangements made in a small hospital. Worthing Hospital is believed to be the first voluntary hospital to have a service organised by the public library. Thirty to fifty books are sent from the library to the hospital and exchanged month by month. A proportion of the new cheap editions, replacements, and rebound books which are passing into the library are reserved first for the hospital service. For several years in succession the association have devoted a session to this subject and the increasing interest shown is evidence that hospital authorities can rely upon the sympathetic interest and assistance of the library authorities in providing a book service for patients.

A POPULAR EXPOSITION OF MEDICAL PROGRESS

Mr. Paul De Kruif has already shown himself to be a master of the art of popular exposition; he has been a laboratory worker himself and unlike many popular medical writers he always gets the right end of the scientific stick. If his emotions are ebullient and his personal interpretations over-dramatic, his facts are generally sound and it is quite clear that his books aim at being something more than merely amusing. They are, in fact, in their way powerful propaganda in the cause of medical research and the advance of public health. In his new book [1] Mr. De Kruif dramatises some of the incidents of present-day medical research and health work, and, incidentally, drags persons into the melodramatic limelight who would probably much prefer to remain in decent scientific obscurity. Unlike the "Microbe Hunters" the book does not confine itself to the big original advances of medical science; it rather describes the type of infantry attack which is daily going on against disease in all parts of the world in laboratories and health offices. Among the subjects are the fight against child-bed death, against pellagra, streptococcal disease, syphilis, and tuberculosis. The chapter on Detroit against tuberculosis is only a piece of local, one might almost say parochial, history brought into the open, but it gives a graphic picture of that odd mixture of efficiency and ballyhoo that makes up a typical American public health campaign. Sticklers for pure and undefiled English and those who are over-sensitive about the dignity of the medical profession had best give Mr. De Kruif a miss; but the reading public as a whole, both lay and medical, will find plenty to amuse and not a little to instruct them and will agree that his flamboyant faults are more than redeemed by some very solid qualities.

[1] The Fight for Life. By Paul De Kruif. London: Jonathan Cape. 1938. Pp. 320. 12s. 6d.

THE BERNHARD BARON LABORATORIES

FORMIDABLE difficulties were encountered in constructing the new research laboratories of the Royal College of Surgeons at the top of the old building in Lincoln's Inn-fields, and Messrs. Lanchester and Lodge, the architects responsible for the work, have now prepared an attractively illustrated pamphlet showing how they were overcome. The alterations included the addition of another story to the central block and the erection of a three-story tower at each end of it, and the support of these towers introduced some intricate structural problems. To bear their weight the main walls and foundations had to be examined and strengthened where necessary and reinforced concrete joists had to be provided to distribute the load over as many points as possible. It is to the architects' credit that they were able to make such drastic changes without detracting from the appearance of George Dauce's original portico. Their account of the new laboratories opened last December should be of value not only to other architects but to all concerned with the planning of research laboratories.

FILM-STRIPS

THE film-strip, which has been introduced as a substitute for lantern slides for showing still pictures, consists of a length of safety cinema film on which is printed a series of individual pictures. These can be shown either by an ordinary lantern with a special adapter or by a simple projector working from the main or from a battery, and can be used in conjunction with a gramophone to give necessary sound-effects or dialogue. Film-strips are lighter and less liable to breakage than lantern slides, and a typical strip containing 18 pictures will go safely by post in a small container for 1½d. Short strips can be bought with descriptive notes for 3s. or can be hired through dealers. New strips are being published every week on a variety of subjects of which a list can be obtained from the agents, Messrs. Ronald Small and Partners, Ltd., of Bush House, London, W.C.2. They should be of considerable use to lecturers and for demonstrations generally.

AN ATHLETE ON TRAINING

MOST great athletes feel the urge to communicate their personal experience but not all are able to do so. Moreover, the desire to emphasise his conception of the mechanics and physiology of violent exercise sometimes leads an amateur in these matters into waters beyond his depth. Mr. Guy Butler [1] has aimed at telling the young man who wants to get fit and to

[1] Athletics and Training. By Guy Butler. London: A. and C. Black. 1938. Pp. 247. 5s.

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win races how to train and how to run as fast as possible. He has said nothing about oxygen-debt or of mysterious foodstuffs which can impart speed or staying power; in fact diet is only mentioned in half a dozen lines respecting the lunch to be recommended on the day of athletic competition, with the special indications for sugar. Mr. Butler makes only one scientific excursion which is open to criticism; we doubt whether his advice to indulge in considerable exercise immediately before a race is altogether wise. The principle that an engine works best when it is warm is sound enough, but in securing the optimum efficiency in this way it would not be easy to avoid an accumulation of lactic acid which only time can disperse. The book as a whole is a sound guide to the principles of preparation and of technique in competitive sport. It is of interest to learn that at the Marathon race the taking of drugs if discovered means disqualification and that the official medical officer is empowered to compel anyone to retire from the race. It is a pity that some names are misspelt—notably Kolehmainen and Cunningham, and a celebrated German starter has become anglicised to Miller.

DOMICILIARY MEDICAL SERVICES IN NEWCASTLE-UPON-TYNE

Dr. J. A. Charles has presented a careful statistical analysis [1] of the working of the system of domiciliary medical attendance under the poor-law in Newcastle-upon-Tyne. The system has undergone modification since its introduction in November, 1933. Originally applied to 6 of the 10 medical relief districts of the city it now applies to 8, and it is estimated that the average number of persons in receipt of relief in these districts during the period under review was 15,095; these presumably might be regarded as potential patients.

Original medical remuneration was from a pool of £1200; in March, 1935, there was introduced the capitation system of payment of 5*s*. per quarter per patient treated with a payment of £1 for a "chronic" case—i.e., one requiring treatment for more than two consecutive quarters; since January, 1938, an increase of 25 per cent. in the scale of fees has been granted. There are extra fees for certificates, confinements, and emergency medicines. Drugs are supplied from two dispensaries. Expenditure on medical services was: remuneration of practitioners £3950 15*s*., fees for certificates £326 16*s*., fees for confinements £33, emergency medicines £8 13*s*. 10*d*.—total £4319 4*s*. 10*d*. The number of persons treated was 10,707, the average cost per patient in medical remuneration 7*s*. 4·5*d*., the average number of unit services per patient 8·4, and the average remuneration per unit service 10·6*d*., which may be compared with the figure of 5·656*d*. under the original pool system. The cost of the dispensing services was £1637, or 3*s*. 0·7*d*. per patient treated, and of clerical services, &c., £362, or 8·1*d*. per patient treated. The final average total cost per patient treated was 11*s*. 9·6*d*. The number of participating practitioners was 56, or 55 per cent. of the National Health Insurance panel.

Medical records are kept and the somewhat non-committal statement is made that they "are kept with a degree of accuracy and completeness not inferior to the standard of record keeping under the National Health Insurance Scheme." Much useful information has been abstracted from these records. It may be noted that children under 15 years of age constituted 43·5 per cent. of persons treated. A table compares the incidence of groups of diseases with those recorded for insured persons. There are unexpected differences considering the large proportion of children—for example the figure for organic heart disease is 55·9 per 1000 as compared with 12·6 among insured persons, and the corresponding figure for malignant disease is 3·9 as compared with 1·8. Another table shows the age-distribution of various forms of rheumatism. Such medical records, if accurately kept, should assist in throwing light on the incidence and distribution of sickness.

A fear expressed on the introduction of this method of medical attendance was of the possible increase in the prescription of medical extras. It is shown that in Newcastle there has been an increase per patient treated from 1*s*. 4·4*d*. under the previous system to 2*s*. 0·1*d*. Dr. Charles adduces various reasons for this increase. A further anticipation was as regards possible discordant relations between relieving officers and a much larger number of practitioners, and it is satisfactory to learn that such relations have been excellent.

This is a useful report. It is clear that the cost of the service has increased and is increasing, and unfortunately the demands on the domiciliary medical service are especially heavy in districts whose financial resources are otherwise severely strained. The important consideration is whether there has been improvement in the standard of medical service commensurate with the increased cost, and this cannot be gauged by any statistical analysis. On the question of cost Dr. Charles says: "In view of the inadequate remuneration paid to the medical officers under the old arrangement, any comparison of the cost of the two systems is also quite fallacious."

[1] Report of the Medical Officer of Health of the City and County of Newcastle-upon-Tyne on the Working of the Domiciliary Medical Services in the Joint Medical Relief District during the period March 1st, 1936, to Feb. 28th, 1937.

THE NEW PATHOLOGY BUILDING AT GUY'S HOSPITAL

THE new building opened at Guy's Hospital by the Earl of Athlone on June 23rd will bring into a self-contained unit the formerly scattered laboratories of pathology, clinical chemistry, and bacteriology and will provide these departments with much-needed accommodation for teaching and research. It will also house the new clinical research unit. The building stands behind the present anatomy and physiology departments on the site of Spur Inn-yard. It has cost about £85,000, half of which has been paid by London University and half by the medical school from accumulated surpluses.

The lower ground-floor contains a large lecture theatre and a smaller theatre for practical demonstrations, both of which can be rapidly darkened by electrically operated blinds, and a well-equipped workshop for instrument-making and repairs. The upper ground-floor is occupied by the physiology class-room and research room and the physics department, and the two floors above this will contain the department of bacteriology. The clinical chemistry laboratories and research rooms for the pharmacologist are on the third floor, and above these is the pathology department, with a comfortable and well-lighted library.

The fifth floor contains a room for kymographic work, a sterile operating-room and preparation room, laboratories for research in experimental pathology and for the clinical research fellow, and four rooms for the clinical research unit. The top floor will house the experimental animals. Three rooms, complete with steam sterilising equipment, will be used for inoculated animals, and entirely apart from these there are two large and six small rooms, all opening out of a central glass-covered area, in which the stock animals will be kept. In this way it will be possible to segregate completely animals in quarantine and infected animals.

Mr. HANS ROWAN-HAMILTON writes (from 9, Thurloe-square, London, S.W.7.): In preparing a genealogical history of my family, the Hamiltons of Killyleagh, Co. Down, I find that there was in use in 1649 a drug called Histernum Crapulum which was used for "fleabittings" I should be grateful if any of your readers would tell me the nature of this drug.

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MEDICAL LIBRARY
HISTORICAL BUILDING
DES MOINES, IOWA

REFERENCES AND ABBREVIATIONS

Readers in search of a given subject will find it useful to bear in mind that the references are in several cases distributed under two or more separate but nearly synonymous headings. Institutions and Corporations with the right to the prefix Royal will be found under that prefix, with the exception of Hospitals, which will be found under that heading; and Medical Societies, which are separately indexed under Societies. All Universities are indexed under the word University. (*A*) = *Annotation*, (*C*) = *Correspondence*, (*LA*) = *Leading Article*, (*ML*) = *Medico-legal*, (*NI*) = *New Inventions*, (*O*) = *Obituary*, (*PI*) = *Parliamentary Intelligence*, (*R*) = *Review*, and (*PCP*) = *Panel and Contract Practice.*

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